Only 85p

commodore HORIZONS

December 1984

TV EYE FOR YOUR 64

MICRO MUSIC
We review a clip-on keyboard for the 64

C16 GRAPHS
David Lawrence reveals how to draw graphs

VIC20 JOYSTICKS
How to program from Basic

Steve Lee presents RAT WHACK

STAR PRIZE
Win a C16 & Plus/4

WIN 10 Currah Micro Speech Units

DISCOUNT CLUB
Special Offers

GHOSTBUSTERS™ THE COMPUTER GAME.

BY DAVID CRANE

© 1984 COLUMBIA PICTURES

Yes. Ghostbusters is a computer game, too

The game play follows the film with incredible accuracy Even down to the chart-topping music score

Your task is to rid the world – and in particular New York City – of a cataclysmic plague of ectoplasmic nasties

Play it well and we give you a Ghostbusters franchise – with your own secret account number Use this number and the money it brings you, to buy the same ghost busting gear they had in the film (Don't worry – we'll give you some money to get started.)

You will have earned it. And you can use it to go to undreamed of levels Don't try to use someone else's number, we'll find out

From then on, it's you against the ghosts. All the way to the Temple of Zuul

Where the final battle begins

Designed by USA's David "Pitfall II and Decathlon" Crane and running on Commodore 64 cassette and disk and Spectrum Coming soon on other systems

ACTIVISION®

Your computer was made for us.

AVAILABLE FROM SELECTED BRANCHES OF BOOTS WH SMITH JOHN MENZIES, LASKY S SPECTRUM RUMBELOWS WOOLWORTH
AND GOOD COMPUTER SOFTWARE STORES EVERYWHERE.

Only the
commodore
HORIZONS

Editor
Brendon Gore

Assistant Editor
Christopher Jenkins

Editorial Secretary
Geraldine Smyth

Group Advertisement Manager
David Lake

Advertisement Manager
Jeremy Kite

Administration
Theresa Lacy

Managing Editor
Duncan Scot

Publishing Director
Jenny Ireland

Telephone Number
(all departments)
01-437 4343

UK address
Commodore Horizons, 12-13 Little Newport Street, London WC2R 3LD

US address
Commodore Horizons, c/o Business Press International, 205 East 42nd Street, New York, NY 10017

Subscriptions
UK £10.00 for 12 issues, overseas surface (excluding US and Canada) £16.00 for 12 issues, US and Canada airlifted US$33.95 for 12 issues

ABC

Submitting articles
Commodore Horizons welcomes readers' contributions — either articles or program listings. Articles should be typed double spaced with a wide margin. Programs should, whenever possible, be printed out on plain white paper, accompanied by a cassette. We cannot guarantee to return every article or program submitted so please keep a copy. If you want to have your program returned you must include an s.a.e.

SUNSHINE

Commodore Horizons is published monthly by Sunshine Books, Scot Press Ltd. Typeset by In-Step Ltd, 33-41 Dallington Street, London EC1. Printed by Riverside Press Ltd, Thanet Way, Whitstable, Kent. Distributed by SM Distribution, 16-18 Trinity Gardens, London SW9 (telephone 01 274 8611 telex 261643). ISSN 0265-4164. Registered at the Post Office as a newspaper.

© Sunshine Books 1984

CONTENTS

Letters 7
Some technical points cleared up, the last of Pubquest (?), and the adventures of Fink

News 8
Diamonds to win in Spirit of the Stones, Tymac talking games, and 64 music

Vic Sticks 15
Following last month's 64 joysticks article Colin Walls explains their use on the Vic

Soft Hits 18
The biggest and best Commodore games software roundup

Video Digitising 22

Jeff Naylor takes a professional look at Digithurst's Microsight system for the 64

Profile 26
Chris Jenkins talks to Steve Lee, author of Falcon Patrol for Virgin Software

Start Here 29
Sarah Cotton explains the basics of Basic

3-D Graphics 37
Adrian Warman presents a program for the 64 with Simon's Basic

MusiCalc strikes up 42
David Fox plays on the 64

Music Maker 44
David sounds off again, this time with Commodore's clip-on keyboard

Discount Club 46
Another chance for Supersoft bargains

Flight Simulator 2 50
Pete Gerrard takes to the air with this impressive Sublogic program

Star Game — Rat Whack 53
Steve Lee's Hideous Bill features in this vermin stamping game for the 64

Plus/4 — C16 Contest 59

A Christmas bonus — win a Plus/4 or C16

The Working C16 61
An extract from David Lawrence's book on Commodore's new micro

Software File 73
Readers' programs including giant letters on the Vic and Laser Zap on the 64

Imprint 83
Book reviews including easy Basic on the Vic and difficult programming for the 64

Answer Back 85
Jack Cohen's latest look at readers' software and hardware problems

Eureka! Currah contest 90
Domark, producers of the £25,000 Eureka prize adventure, offer ten Currah Speech 64 voice synthesizers

EDITORIAL

NINETEEN EIGHTY FIVE may yet be the year of the 16-bit computer. The home micro boom, which has been almost exclusively 8-bit based, is due to evolve into a more advanced, and possibly more stable, market. The days of microprocessors such as the Z80, 6809 and 6502 are, if not exactly numbered, at least on the wane.

This is not to say that 16-bit computers are either revolutionary or startlingly new, just that up to now they have been mainly confined to business and upmarket personal machines such as the Apple Macintosh. Sinclair was arguably the first company to break this mould with the £399 QL, based around the 68008 chip. But, many people would dispute this machine's claims to be a true 16-bit machine, limited as it is by an 8-bit buffer.

However, Commodore has announced its intention of joining the field with the purchase of Amiga, a small hardware company based in Santa Clara, California. This company has built a 16-bit home computer which is expected to cost less than $1000 (£750). It should appear in Commodore colours some time next year and might even be on display at the Consumer Electronics Show in Las Vegas in January.

Just to complicate matters still further, Atari is suing Amiga for $100m for alleged breach of contract. Amiga had a development contract with Atari while the latter was still owned by Warner Communications, though the contract was subsequently cancelled by Amiga.

Given that the Japanese have based their MSX standard on the 8 bit Z80 chip, it makes sense for competing manufacturers to upgrade the specifications of their machines. Perhaps Sinclair, which has just launched its 8-bit Spectrum +, will enter the fray with a cheap 16 bit games machine in time for Christmas 1985. Certainly Atari seems to be looking in that direction.

The vogue for judging home computers on the amount of RAM they contain may be passing. The new touchstone could be whether it is 8 or 16-bit — or maybe even 32-bit?

JAVA JIM...
COUNTDOWN TO MELTDOWN
BIRD MOTHER
WING COMMANDER
CREATIVE SPARKS

QUALITY CONTROL FROM CREATIVE SPARKS ON C64

For those who demand excellence

JAVA JIM

Gui[illegible] Java Jim [illegible]und the screen [illegible] [illegible]uare holes as he sear[illegible]es for ancient relics. Y[illegible] [illegible] have to avoid the lumps of [illegible] lava being continually sho[illegible] [illegible] down on Jim from the still [illegible] no in this highly [illegible]inal fun game.

4 full graphi[illegible] [illegible]n screens.
[illegible] levels of play
[illegible] score feature.
[illegible]oading cassette.

COUNTDOWN TO MELTDOWN

An amazing graphic action adventure game which puts you in charge of a team of androids trying to reach the core of a nuclear reactor before it explodes.

This game has over 2000 rooms to be negotiated and every single one of them is in 3D!!

Probably the most exciting game yet developed for the C-64.

Fast loading cassette.

BIRD MOTHER

This is a delightfully original game which uses nature as the setting for a highly compelling and challenging game. Guide the Bird Mother as she builds her nest and raises her young, finally protecting them from a predator hawk.

Fast loading cassette.

The stunning graphics and music in Bird Mother are not to be missed.

WING COMMANDER

This is a highly sophisticated flight combat simulator which puts you in the pilots seat. Highly advanced machine code programming has ensured you feel every stomach lurching dive and roll.

With 17 separate controls to be monitored and several ground targets to be defended from the attacking enemy bombers. This game will stretch your skills to their limits.

Fast loading cassette.

Available from All good computer software stockists.

Send me (tick as required)

- ☐ **JAVA JIM** TNCE163 (C64) **£7.95**
- ☐ **COUNTDOWN TO MELTDOWN** TNCE273 (C64) **£7.95**
- ☐ **BIRD MOTHER** TNCE263 (C64) **£7.95**
- ☐ **WING COMMANDER** TNCE203 (C64) **£7.95**
- ☐ My local stockist's address
- ☐ Your full list of games

Game/s at £7.95 each £ ______ p
+ single P&P sum 30p
Total to send £ ______ p

Method of payment
By cheque or PO (no cash) made payable to **TECS**
or ☐ By Access
Enter card no ☐ Barclaycard
|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|
Sign below ______

Credit card sales UK buyers only
Response within 21 days.

Creative Sparks,
Department MC
296 Farnborough Road,
Farnborough, Hampshire, GU14 7NF
Telephone (0252) 518364

Name ______
Address ______

CH1184

8 EIGHT GOOD REASONS TO GET A DISC DRIVE FOR YOUR COMMODORE 64

Australia Produces

THE CLIENT FILE
Your business is dependent on how well you know your customers and the services they require or could use. The Client File system allows you to simply, painlessly and quickly access customer records individually or by characteristics with integrated word processing for reports, letters, labels, etc.

☐ Until now a **Data-Base** Program to perform any of these tasks would leave little change out of £100; add the extra for a Letter Editor and you will have even more room in your wallet or purse.

☐ Only £24 plus V.A.T. for the **ABRAXAS Data-Base Manager** of your choice.

REMARKABLY VERSATILE

Look What You Get .....

☐ The **Data-Base Management System** can record up to **1000** screen size "Record Cards" (per data disc) on any information you want.

☐ The system has a built in calculator so it can record and calculate costs, profits and amounts etc.

☐ Records can be displayed on the screen or printed using the report feature. It will sort and produce mail lists, price lists, delivery reports etc., in any order you require.

☐ In addition some 26 single page letters can be stored for instant recall on each data disc and there can be as many data discs as your business or interest demands.

*The **Data-Base Management System** will run on your Commodore 64 and SX64 Computer.*

NO SETTING UP REQUIRED
JUST FLIP YOU PROGRAM DISC
OVER AND YOUR DATA BASE IS
READY TO USE FOR ONE OF THE
FOLLOWING —

THE ROUNDSMAN
Your business is delivering goods and/or services on a regular basis to your customers. Your basic units of business are your customers (organised into rounds) and the goods or services you provide. Relating the two, obtaining accurate information and communicating knowledgeably with your clients will dramatically improve your performance hence your profit.

THE AUTO DEALER
Your basic units of business i.e. customers (past, current and prospective) and vehicles. Control of your business relates to accurate usable records and information. Your files are a veritable gold mine of information. This system allows accurate current information to become a tool of business with reports, letters etc. able to be produced related to your file information.

THE COLLECTOR
For the hobbyist or business use, irrespective of the nature of the collection you need to know what you've got and where to find it. This program is the answer to your specific needs. It not only keeps files and values, it can produce reports, labels and letters as required.

THE SALES REPRESENTATIVE
Your life blood is sales of goods or services at a profit. Your tools are products and customers and your success depends on the quality of information you have on each and how you relate your products to your customer needs. Producing personalised letters and reports for your customers will show your true professionalism.

THE STOCK FILE
The Stock File is really two things in one, a file processor and a word processor. You can set up and manipulate files and then produce reports and letters with information from those files e.g. stock lists, price lists, quotations, etc.

THE MEMBERSHIP MANAGER
There is no such thing as a typical member of your club, group or business. You need to categorise them by any number of parameters. You need to know before their membership expires, you need to know if they're subscribed and you need to communicate personally by category or totally with them.
The Membership Manager puts you in control of your organisation and everyone will know.

THE REPAIR SHOP
Your business is repairing products at a profit. You probably have some tricks of the trade which give you the edge on the competition. With this system and your special skills you can keep records on customers, products, spare parts and history of units so you can even personally produce letters and reports for your customer!

Our **London Office** will be operating from **15th November 1984.**

Write Now To -

ABRAXAS SOFTWARE
151 Hutt Street, Adelaide,
South Australia 5000

NAME -

ADDRESS -

PHONE -

Abraxas Phone 0103-8-2235133
Telex AA87509

Mirage

SOFTWARE &
DISTRIBUTION

9 Rossini Street
Seaforth
Liverpool
L21 4NS
Tel 051-920 9713

PROGRAMMERS

WE ARE LOOKING FOR TOP QUALITY PROGRAMMES TO MARKET IN THE UK AND ABROAD. THE PROGRAMMES MUST BE OF TOP QUALITY AND IN MACHINE CODE WITH GOOD GRAPHICS AND SOUNDS AND ORIGINAL CONCEPT. WE ARE LOOKING FOR PROGRAMMERS TO CARRY OUT WORK ON NEW MACHINES SUCH AS THE C.B M/16 AMSTRAD AND M S.X. WE CAN SUPPLY THESE MACHINES TO CARRY OUT WORK FOR MIRAGE. WE ARE ALSO OFFERING £500 PRIZE FOR THE BEST PROGRAMME RECEIVED BY THE END OF FEBRUARY 1985 WHICH WE WILL DECIDE TO MARKET. WE OFFER AN OUT RIGHT PAYMENT OR 10% PLUS PAYMENT OR 20% ROYALTIES. FOR MORE INFORMATION CONTACT THE SOFTWARE MANAGER HE WILL BE GLAD TO LISTEN TO ANY QUESTIONS YOU MAY HAVE.

SOFTWARE HOUSES

WE ARE LOOKING FOR TOP SELLING PROGRAMMES TO DISTRIBUTE TO OUR WIDE RANGE OF OUTLETS THROUGHOUT THE UK AND GIVE YOU A VERY FAST SERVICE TO HELP WITH YOUR SALES AND TO MAKE THE MOST OF YOUR PRODUCTS. SEND A SAMPLE COPY OF YOUR PRODUCTS WITH RATES AND TERMS FOR A FAST ASSESMENT FOR MORE INFORMATION CONTACT THE SALES MANAGER HE WILL BE GLAD TO HELP AND ASSIST YOU.

DEALERS AND DISTRIBUTERS

DEALERS WE HAVE THE BEST SELLERS FROM THE BEST PRODUCERS, WE ALSO OFFER VERY GOOD RATES AND TERMS TO HELP YOU AND US TO ACHIEVE THE BEST SALES AND SERVICE. FOR MORE INFORMATION CONTACT THE SALES MANAGER.

DISTRIBUTERS HAVE YOU GOT THE MIRAGE RANGE ON YOUR SHELVES, IF NOT THEN CONTACT THE SALES OFFICE FOR SAMPLES AND RATES.

SALES MANAGER
T.C. SAPHIER

SOFTWARE MANAGER
C.A. SAPHIER

LETTERS PAGE

D-I-Y reset

I HAVE managed to construct a very simple reset button for the 64 by connecting a push to-complete switch across pins one and three of the user port. Pressing the button has the same effect as SYS64738, but of course is independent of the keyboard, so any RUN/STOP-RESTORE disabling pokes are rendered useless

Construction is as complicated as you like, my switch cost 50p and took only three quarters of an hour to assemble This however is the luxury model, and the "device" can be made for nothing at all using a short piece of wire or a paper clip! The pins used are 1 (ground) and 3 (reset) ONLY, not pins A and C underneath the board

Crocodile clips with the lower jaws taped over, or pieces of edge connector can be used to wire up the pins, and the effect is to return the 64 to Basic You could then, for instance, PEEK addresses 2040 to 2047 to look at the sprites — the rest is up to you!

Paul Baylis
Hull
E Yorkshire

Kiwis compute

THANK YOU for your interesting and helpful magazine, which is available every month in New Zealand, unlike some such as Compute! which we have not seen since April

A plea for overseas readers — we don't have enough time to enter your competitions by the end of the cover month

We run a very successul User Group and have a library of cassettes and books and a 1520 printer/plotter Tapes can be borrowed freely, and as a club we can afford to buy more programs than people would individually — although they cost a small fortune here, cartridge games averaging $79-$99, though good cassette games have come down recently to $24 99

Please, more educational programs and programs for the 1520!

Brenda McLeish
Bay of Islands Computer Group
PO Box 119
B O I
New Zealand

Beating Beach Head

WITH REGARD to the letter on BeachHead from Ian Davies of Mid-Glamorgan, high scores can be achieved due to a slight glitch in the tank section when the pink enemy tank appears Shoot it and keep shooting at the 1000 point score flash — it will add 1000 points each time you hit it But don't leave it too late or you'll crash

My high score on BeachHead is 156,600

Sean Miller
Yeovil

WE'RE STILL pondering whether to include a high-score section in *Horizons*. Any comments?

Back-answer

I REFER TO THE "overlay" technique for Basic programs, described in Answer Back in August

I tried out a pilot program on my Vic, and found that the new program would retain all numeric variables correctly from the old, but that with string variables the wrong string would frequently be returned I would be most grateful if you could let me know how to overcome this program on the Vic

John W Dunster
Chigwell
Essex

THIS answer relates to all Commodore machines If a string is defined in the text, then that string is taken from the text upon program execution. However, when you load another program that text is overwritten, and that pointer then calls apparent garbage

When a string is created by the program, then the strings are stored in high memory, growing downwards from the top of Basic.

These are safe from being overwritten by LOAD from within a program

The answer to your problem, then, is to redefine the string without changing it, and the redefined string will reside in high memory For instance, if your program line reads 100 a$="NAME", then alter line 100 to read 100 a$="NAME":a$=a$+""

The "" adds a null, and has no effect on the length of the string

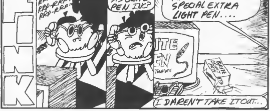
Time, gentlemen...

I'M WRITING in reply to John Worts' problem with **Pubquest** When you get to the danger sign, throw your paving slab and continue north After doing this you can return to the tramp, say something, and quench his thirst

Evan Jones
Yeovil

IF THINGS go on like this, we'll have to start up an adventure column. What do you think . . . ?

This is the chance to air your views — send your tips, complaints and compliments to Letters Page, Commodore Horizons, 12-13 Little Newport Street, London WC2R 3LD


COMPUTER
FINK
RRP-RRP!
RRP-RRP!
RRP-RRP!
HULLO, IS DIS BRITE PEN INC?
I'M COMPLAINING ABOUT YOUR NEW SPECIAL EXTRA LIGHT PEN....
ITE EN TWARE
BRITE LIGHT PEN
I DARENT TAKE IT OUT...

NEWS DESK

Tymac all talk?

TYMAC TALKIES look like making a big impact on the Commodore software market, when the games, which incorporate speech effects generated with no extra hardware, are released in the UK

Tymac's origin is as a manufacturer of precision engineering tools in the USA From there the company diversified into home computer peripherals, and now a range of Tymac software is to be marketed by a UK wing

Spokesman John Sage explained that the speech routines, developed specially by Tymac, add an extra dimension to the games without adding the cost of speech synthesis hardware Moreover, Tymac's graphics routines are very impressive, especially on Vic 20 games like **Samurai**, an exciting martial arts battle game, and **Codename Deadzone**, an underground rescue mission featuring colourful perspective graphics

Tymac's first release will be **Flyer Fox,** which was the subject of negotiations with the **US Gold label** at one time **Flyer Fox** is a combat flight simulator in which you control a fighter assigned to defend airliners against enemy attacks

Other forthcoming titles include **Gandalf,** a magical arcade adventure, **Pegasus,** based loosely on the scenario of the film **Clash of the Titans, First Strike** a nuclear war simulation, and **Type-Snyper** a typing tutorial program which is actually fun

Tymac games will be £14 95 on disk and £9 95 on tape Contact John Sage, Tymac Nettleton House, Calthorpe Road, Edgbaston, Birmingham, 643 8899 for further details

CBM's spirit of adventure

COMMODORE'S new book- and software arcade adventure **Spirit of the Stones** offers 40 prizes of jewelled ''talismen'', as well as the chance to win a share of the Royalty Fund based on the number of units sold

The book on which the program is based is by John Worsley, and is set on the Isle of Wight The supernatural adventure, involving smugglers, murderous revenue men and hidden diamonds, offers clues to the location of the prizes on the Isle itself — but you don't need to travel to solve the riddle and find the treasures

The book was released in the South of England six months ago, and already four of the jewelled prizes have been found When the Commodore book-and-software package reaches the shops in November, it will include extra clues in the arcade game, which features a scrolling map of the island and 21 arcade challenges showing evil spirits blocking your attempts to find the diamonds The program is by Ian Grey, responsible for many of Interceptor's most successful programs, and Lee Brame

Spirit of the Stones

Solving the arcade games reveals code letters which must be combined with the runic clues in the book to unravel the mystery of the hiding places of the talismen and the Great Wight Eye

The cassette or disk-based package will cost £14 99, and 50p from each sale will be contributed to the Royalty Fund The Fund will be divided with one share going to each finder of a talisman, and ten to the finder of the Great Wight Eye It will be closed in 1993, or at £1m, or when all the talismen have been found

Dynamite database

IF YOU HAVE a use for a 64 database program, but don't want to pay 50 or 60 pounds, Dynamite Software might have the answer with **Database 64.**

The tape-based program costs £7 99, and allows up to 30 000 records with 15 fields per record, 25 bytes per field and 255 bytes per record The Database is menu-driven and contains on-screen help messages Scrolling, save/load, add, insert, delete and amend are fully implemented

Dynamite also offers a 64 **Assembler/Disassembler** package, which allows variables, labels, pseudo ops and control commands The disassembler will deal with any part of the 64's memory, including the operating system and Basic interpreter

The Assembler/Disassembler costs £7 99 on tape, and comes with a manual

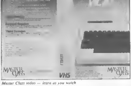
For more details of these and other Dynamite packages, contact Dynamite Software, BCM 8713, London WC1N 3XX

Vic on video

IF EVEN the best programming tutorial book leaves you in the dark, perhaps Master Class Video can supply some illumination

There are four videos in the Commodore programming series, Vic 20 Level One and Two and Commodore 64 One and Two Each of the one hour cassettes is presented by David Redclift, who demonstrates screen and keyboard techniques, data entry, and more advanced programming techniques As a bonus the soundtracks of the cassettes contain Basic programs which can be loaded into the computers The video cassettes are available in Betamax and VHS formats, at a cost of £19 95

For details of these and a range of other packages, contact Dynamite Software, BCM 8713, London WC1N 3XX



Master Class video — learn as you watch

LVL in tune with Echo system

FOLLOWING last month's release of Commodore's Music Maker clip on keyboard for the 64, hardware specialist LVL takes another approach with the introduction of the **Echo 1** full-size mechanical keyboard

The **Echo-1** is a three-octave unit with a wood and metal case, costing £99 95

Also available is an amplifier output kit, **Echokit,** which enables you to connect your 64 to the £49 95 **Echo-sound** amp speaker unit This 6watt, 6 inch dual cone device has volume and tone controls and a wooden cabinet

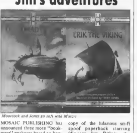
The Echo 1 keyboard comes complete with a software package, **Organ Master** which allows programmed and real time control of the SID chip Additional Echosoft packages are in preparation

We hope to carry a full review of the Echo system in a forthcoming issue

Contact LVL, Scientific House, Sandiacre, Nottingham, 0602 394000

LVL's Echo system — play away on the 64

Oswald, Erik and Jim's adventures



Moorcock and Jones go soft with Mosaic

MOSAIC PUBLISHING has announced three more "bookware" packages based on best selling paperbacks

The Saga of Erik the Viking by Monty Python star and mediaevalist Terry Jones, contains a 64 program and a 20-page booklet It's a text adventure programmed by Level 9, costing £9 95

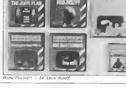
Harry Harrison's **The Stainless Steel Rat Saves the World** is an illustrated text adventure complete with a copy of the hilarious sci-fi spoof paperback starring Slippery Jim DIGtiz, the galaxy's sneakiest con-man turned secret agent Cost is again £9 95, as is that of **The Nomad of Time,** an illustrated text adventure based on Michael Moorcock's Oswald Bastable series Programmed by Shards, **The Nomad . . .** comes with a 16 page booklet

Contact Mosaic, 187 Upper Street, Islington, London, 01 226 0828

Mirrorsoft seeks the practical touch

MIRRORSOFT, known so far largely as a producer of games aimed at the young end of the market, has branched out into "practical software" The **Home Discovery** series is a suite of five programs for the 64 and other machines and comprises a weight control program, **"The Joffe Plan"**, a **"Know your Own Personality"** package based on a book by Hans Eysenck and Glenn Wilson, **"Know Your Own Psi-Q"** a psychic self testing program by Carl Sargent Head of Experimental Psychology at Cambridge, **"Star Seeker"**, an astronomy program developed in conjunction with the London Planetarium, and **"Mastermind"** the program of the programme courtesy BBCTV

Most of the Home Discovery series has been written by Ivan Berg Software Cassette versions will cost £9 95 and disks £12 95, and the packages will be available mail order from Mirrorsoft



Home Discovery — 64 know thyself

Supabasic offers 72 extras

INTERCEPTOR, best known for arcade games for the 64 and Vic 20, has made an entry into the utilities market

Interceptor Supabasic is a Basic extension package adding 72 programming commands for the 64 Areas covered include hi-res graphics, sound, sprite control and programming aids The package comes with a 40-page manual

Supabasic sets a precedent by being available at the same price for disk or cassette versions — £9 99

We'll be reviewing Supabasic in a future issue Meanwhile contact Interceptor at Linden House, The Green, Tadley, Hampshire for more details

the six-four supplies co

p.o. box 19, whitstable, kent ct5 1tj

Access/Barclaycard orders: 0227 266289

...Number One For Choice...

The Six Four Supplies Company is the premier independent mail-order supplier of products for the Commodore 64. Shop by mail order in confidence — and experience the kind of service enjoyed by thousands of regular customers in the UK, Europe and as far afield as Fiji. We can provide anything from our catalogue of over 1000 items of recreational, educational and business software. (Catalogue 50p and large SAE but free to customers.)

AMERICAN IMPORTS — PRICES PLEDGE We are prepared to offer the lowest prices on all imported software. Phone for a quote if you are in doubt!

Please add 50p P&P for orders under £20 (Europe £1 each item. Airmail elsewhere at cost). Make cheques/POs payable to **THE SIX FOUR SUPPLIES COMPANY**

DISCO
£9.95

(Softcell) — cassette

This is the most powerful tape to disk transfer utility you can buy. No program rewritten necessary. Menu driven.

TAPER
£9.95

(Softcell) — cassette

Make security backups of your own BASIC/machine code programs. Very very powerful.

FASTBACK
£9.95

(Softcell) — cassette

Can make backups with a difference — they will load up to seven times faster than the original. Impressive!

SPECIAL OFFER All three — Taper, Disco, Fastback — for £25.75 (Note: As with any similar programs these products cannot work on speedload programs.)

Dealer enquiries welcome

DISKEY
£36

(Adventure Int) — disk

Diskey gives your Commodore 64 the file handling and disk editing capabilities a serious user needs. Copy SEQ, PRG or USR files with ease. Allows you to examine, copy or modify any disk. Rescue data from a crashed disk or simply recover scratched files. For one or two disk units. Also available for single disk users is the slightly less versatile but no less powerful SUPERDISK UTILITY (£13.50)

PAPERCLIP
£75

(Batteries Inc) — disk

LOOK AT OUR LOW LOW PRICE! If you've been saving up for a wordprocessing program then this is the one to get. For those that actually do know, this is still the best in a very strong field. With 80-column display mode. Can be used with 80-column board (£99). Full selection of other WP programs available.

MULTIPLAN
£95

(Microsoft/Hesware) — disk

Easy to use but very powerful spreadsheet. Option to define cells by word labels. Sorts columns/rows numerically or alphabetically. Output to Commodore printers only. Very highly recommended. (Companion books on its use available.)

CALCRESULT
£95

(Handic) — cartridge + disk

Has true 3D (multipage) facility and histogram features. Versions for Commodore and Epson printers. This is a very powerful and much respected spreadsheet. Single page version £47.50 (cartridge)

MICRO ASSEMBLER
£55

(Supersoft) — cartridge

Features three pass assembler, unlimited labels, source files can be linked, monitor, screen editor, disk or tape operation. Plus AUTO DELETE FORMAT FIND NUMBER DISASSEMBLE OUT and TABLE. Monitor has standard TIM commands plus hunt, transfer and disassemble.

HS-64 ASSEMBLER DEVELOPMENT SYSTEM
£55

(JCL Software) — cart + disk

Cram packed with all the features you need to write machine code, BASIC and hybrid programs. Cartridge and disk with assembler, editor, DOS support and a sophisticated monitor. Disk includes assembler and worked examples which you may be able to link to your own programs. Features include AUTO FIND CHANGE DELETE TYPE GET PUT DO LIST RENUM JOIN SCROLL CBM ASCII RBAS SIZE SETBRK CLRBRK BOOM and number system conversions. And there's a great deal more — including a fine assembler feature! This is the most versatile assembler toolkit available for the 64 — the one that the chaps at Corby use! A special deluxe version with the assembler also on ROM is available (£POA)

KOALAPAD
£80

(Koala Tech Corp) — cart or disk

This really is a great device for getting even the youngest of kids to relate to the computer — but capable of much else and fun for the whole family! Comes complete with KoalaPaint which is fantastic for graphics. Facilities include zoom, copy, colour swap, draw lines, rays. Pictures can be saved to disk, dumped to printers or incorporated within your own programs! Programmers Guide — disk £14 — outlines ways in which the pad may be used and explains programming needed. Support programs (disk) include LOGO Design Master (£33), Spelling (£33), Colouring (£25). Other pads are available.

MICRO-SIMPLEX
£173

(Micro Simplex) — disk

If you're in a cash business and need to maintain an accurate audit trail and VAT records this is the program for you! Will save hours of paperwork. Fully recognised by the authorities — it's based on the Simplex book keeping system. Suitable for schemes A to F. Demo available.

THE LAST ONE
£57.50

(DJ AI Systems) — disk

SPECIAL OFFER PRICE!!! Program generator that frees you from the drudgery of writing tailor-made data management programs. Create commercial suitable database programs with ease. TLO creates standalone error free coding in standard BASIC which can then be compiled if required (PETSPEED £50). Input is in the form of one line descriptions defining in plain English the user's requirements. Programs you create can be for any application and as simple or as sophisticated as you like. Very highly recommended — BUT HURRY!

S.A.M.
£48

(Tronix) — disk

This is SOFTWARE AUTOMATIC MOUTH, a quite outstanding piece of software which gives your 64 limitless speech synthesis capability. Offers English text to speech or phonetic input in direct or program modes. Full control over pitch, speed, inflexion. Expensive maybe but there's nothing like it even on hardware!

SUPERBASE 64
£48

(Precision) — disk

Really excellent database management program still at our special price. This one's the best of its type and a must for all serious 64 users. Can be used for anything from mailing lists to stock control and invoicing. Lets you tailor a database, its prompts and displays to your exact requirements although the core program always remains the same. Has database features that are easy to use yet powerful beyond the needs of mere mortals! STEPPING STONE and HOMEBASE application modules — for use with Superbase — also now available. Details on request.

FLIGHT SIMULATOR II
£40/£33

(Sublogic) — disk or tape

This is so good the authors think you can learn the ropes as far as instrument control and flying are concerned! Whatever, the simulation is quite excellent. Expensive but it's the best one for the 64 by far — and a MUST for the collection.

SPECIAL OFFERS

PILOT
(d) £40

ASSEMBLER 64
(d) £45

LOGO
(d) £57

EASY CALC 64
(r) £40

MAGIC DESK
(r) £40

SIMONS BASIC
(r) £45

EASY SPELL (US)
EASY MAIL
(d) £20

Superbase and Paperclip bought together £155!

Amongst the more obscure items we can supply are: ● The XL80 eighty-column cartridge which can be used with Paperclip. Has its own Text editor and spread sheet. Price is £88. ● A parallel bus interface for the 1541 floppy drive! This speeds up data transfer by over five times! Includes cable, interface and relocatable software — price is £75. ● IEEE interfaces — JCL (£88) or DAMS (£82) — to connect your 64 to CBM printers and drives. Fancy a megabyte or two of disk storage — that's how we use some of our 64s! ● Printer interfaces which range from user port parallel cables (£25 including software) — to a cartridge port centronics interface (the very sophisticated Grappler CD £100 or Data 20's at £55) which allows most dot matrix printers to print the special Commodore RDM graphics symbols for program lists or graphic outputs.

BOOKS

There are some 64 books specifically about the 64! We have a full list (50p) with a description of many other books of interest. We can supply ANY book at cover price plus 75p each towards P&P.

ANATOMY OF THE 1541
£14.95

Really excellent book for those keen to get to grips with 1541 use. Absolutely everything you need to know — includes ROM listings, use of programs such as COPYALL on the test/demo disk.

COMMODORE 64 HOME COMPANION
£10.95

If you want more details and explanations on the use of some of the better quality census USA software for the 64 this book is an invaluable source of reference.

PRICES CORRECT AT TIME OF GOING TO PRESS. Let us quote you! If you manage to find lower!

ONLY THE BEST BECOME A....

FIGHTER PILOT

NOW ON COMMODORE 64

The Chart Topping Flight Simulation Now On CBM 64.

48K SPECTRUM

BY D.K.MARSHALL

A SPECTACULAR FLIGHT SIMULATION OF THE WORLD'S MOST EXCITING JET FIGHTER WITH STUNNING 3D COCKPIT VIEW AND THE MOST REALISTIC 3D AIR-TO-AIR COMBAT EVER SEEN ON THE SPECTRUM!

The SUPREME SIMULATION... it leaves the rest at the runway threshold!

OTHER AMAZING FEATURES

- Landing and take off from 4 runways plus steering on the ground
- Fully Aerobatic Performance
- Airfield attack by the enemy
- Cross winds Turbulence and landing in fog
- 4 Pilot ratings, 8 Beacons, ground features and map
- Artificial horizon radar and flight computer
- U/C, Flaps, U/C and system failures
- 100% machine code with complete instructions and pilot notes.

SPECTRUM
£7.95
COMMODORE 64
CASSETTE DISK
£9.95 £14.95
inc VAT & p & p
Joystick Compatible

Definitely the best simulation for the Spectrum
- Crash Micro

TT RACER
£7 95
48K Spectrum

The supreme motorcycle racing simulation for the Spectrum. TT Racer puts you on the hot seat racing for the finishing line. You'll need to be a fearless rider to take the winning flag as only the fastest win

TOMAHAWK
£7 95
48K Spectrum

From the author of Fighter Pilot the first authentic helicopter simulation for the ZX Spectrum. Climb into the hot seat of the meanest death out combat helicopter ever to rule the skies!

NIGHT GUNNER
£6 95
48K Spectrum

Joystick Compatible •

The six battles where only aces survive with enemy fighters attacking from all directions, guns blazing, explosive 3D ground attack sorties and there's still the flight home

WIZARDS OF COMPUTER GAMES SOFTWARE

DIGITAL
INTEGRATION

Watchmoor Trade Centre
Watchmoor Road Camberley
Surrey GU15 3AJ

COMMODORE 64

Fighter Pilot Disk	☐	£14 95
Fighter Pilot Cassette	☐	£9 95

SPECTRUM

Night Gunner	48K	☐	£6 95
Fighter Pilot	48K	☐	£7 95
Tomahawk	48K	**Coming**	
TT Racer	48K	**soon**	

VAT and p & p inclusive within the UK
Overseas [illegible] 50p per cassette

Cheques payable to Digital Integration Ltd
I enclose a cheque/PO for ________ Total
Name________________
Address________________
____

Or debit my Access Account No
☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Please send to Digital Integration Dept
Watchmoor Trade Centre Watchmoor Road Camberley Surrey GU15 3AJ

Tele Sales
(0276) 684959
Trade and Export enquiries welcome Lifetime Guarantee.

WOW! THIS COMMODORE 16 STARTER PACK'S WIZARD!

And cwikey! i

First we jolly well put everything you need to start home computing into one box

Then we placed an obligingly low price on it all under £140 for a computer, cassette unit, a super programming course and 4 great games programs

Boys and girls (of all ages) will just love the Commodore 16 Starter Pack!

The computer has a 16K memory, real typewriter keyboard, 121 colours and also superb sound and graphics

It uses BASIC (this is the language in which you and the computer "talk" to each other, right-ho?)

The BASIC used by the Commodore 16 is very advanced, yet really simple to use This is because it gives you more programming commands

But just in case any of you fellows do have any

ALLDERS ARGOS ASDA BOOTS BRITISH HOME STORES CARREFOUR CLYDESDALE COMET CO-OP CURRYS DIXONS GRANADA GREENS LASKYS JOHN LEWI

commodore 16

it's only £139.99.

difficulties, we also provide you with a Help key

This helps to sort out programming errors by showing you exactly where you went wrong

So you can get more out of your Commodore 16, the Starter Pack also includes "Introduction to BASIC," a guide to programming that any silly chump can follow

And so you can get more enjoyment, there are four jolly good and splendidly challenging games. X-Zap, Punchy, Picture Builder and Chess

If you are thinking of starting home computing, there has never been a better time than now, with the Commodore 16 Starter Pack

No matter what age you are, old thing

commodore

LEWIS MAKRO MENZIES RUMBELOWS SAMACENTRE SPECTRUM SUPREME TESCO WALLACE HEATON W.H.SMITH WOOLWORTH AND NATIONAL NETWORK OF COMMODORE DEALERS

match point
NOW AVAILABLE ON THE COMMODORE 64
WE CHALLENGE YOU
PSION
match point
PSION

Match point for the Commodore 64
and Sinclair Spectrum (48K)

£7.95 including VAT from
leading software stockists

Pulling the switch on Vic joysticks

***Colin Walls** explains how to program the switch joystick*

WHEN THE Vic 20 was first designed, it was intended primarily as a games machine. While it can be used for other purposes, the Vic is supplied with a selection of features with games in mind. One of the most useful and widely applied is the switch joystick. This is quite cheap, rugged and simple, but provides a versatile means of moving things around the screen.

The switch joystick is comprised of five switches, each of which, when closed, connects an output pin to ground (ie 0v, logic 0). One switch is connected to the "fire" button (often at the end of the stick). The other four switches correspond to the four directions of stick movement "north", "south" "east" and "west". These four switches may also be operated in pairs, corresponding to the intermediate positions (ie north east, north west, south-east and south-west).

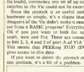
On the Vic, the joystick is plugged into the nine pin connector on the side of the machine. The pins are numbered left to right, top to bottom and used thus

pin 1 — north
pin 2 — south
pin 3 — west
pin 4 — east
pin 5 — pot y (unused)
pin 6 — fire button
pin 7 — +5v (unused)
pin 8 — GND (0v)
pin 9 — pot x (unused)

Armed with this information, the software described below and a suitable plug (it's called a 9 pin "Cannon D" (female) in the trade), connecting any set of up to five switches to the Vic could not be easier.

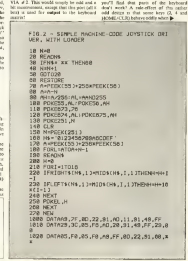
Since the joystick is so useful and the hardware so simple, it's a shame that the designers of the Vic didn't make it easier to use from a BASIC program! Everything is OK if you just want to look for north, south, west and fire. These are connected to bits 2, 3, 4 and 5 of port A of VIA #1. This means that PEEKing 37137 ($9111) gives access to this data.

If you want to detect the joystick in the east position, it's a bit of a problem. This switch is connected to bit 7 of port B of VIA #2. This would simply be odd and a bit inconvenient, except that this port (all 8 bits) is used for **output** to the keyboard matrix!



```
FIG.1 - SIMPLE BASIC
JOYSTICK DRIVING SU
BROUTINE
1000 POKE37154 127
1010 J=(NOTPEEK(37137)
AND60)OR(NOTPEEK(3
7152)AND128)
1020 POKE37154,255
1030 RETURN
```

To overcome this problem, it's necessary to change the direction of this bit to input (temporarily) by POKEing a 0 into bit 7 of the data direction register (ie put a value of 127 into 37154, $9122), before PEEKing 37152($9120). Don't forget to POKE the direction register back to 255 or you'll find that parts of the keyboard don't work! A side-effect of this rather odd design is that some keys (2, 4 and HOME/CLR) behave oddly when ▶



```
FIG.2 - SIMPLE MACHINE-CODE JOYSTICK DRI
VER, WITH LOADER

10 N=0
20 READN$
30 IFN$= xx THEN60
40 N=N+1
50 GOTO20
60 RESTORE
70 A=PEEK(55)+256*PEEK(56)
80 A=A-N
90 AH=A/256:AL=AAND255
100 POKE55,AL:POKE56,AH
110 POKE673,76
120 POKE674,AL:POKE675,AH
130 POKE251,N
140 CLR
150 N=PEEK(251)
160 H$='0123456789ABCDEF'
170 A=PEEK(55)+256*PEEK(56)
180 FORL=ATOA+N-1
190 READN$
200 H=0
210 FORI=1TO16
220 IFRIGHT$(N$,1)=MID$(H$,I,1)THENH=H+I
-1
230 IFLEFT$(N$,1)=MID$(H$,I,1)THENH=H+16
*(I-1)
240 NEXT
250 POKEL,H
260 NEXT
270 NEW
1000 DATAA9,7F,8D,22,91,AD,11,91,49,FF
1010 DATA29,3C,85,FB,AD,20,91,49,FF,29,8
0
1020 DATA05,FB,85,FB,A9,FF,8D,22,91,60,x
x
```

Computerama 64

ALLIGATA

A&F

ADVENTURE INTERNATIONAL

ANIROG

AUDIOGENIC

AVS

U S GOLD

BUBBLE BUS

SID G

BUG BYTE

C D S

C P SOFTWARE

CREATIVE SPARKS

DURRELL

EUROBYTE

IMAGINE

INCENTIVE

INTERCEPTOR

ISP

K TEL

LLAMASOFT

LIVEWIRE

MERLIN

MELBOURNE HOUSE

MICRODEAL

MICRO POWER

MIRRORSOFT

OCEAN

PARAMOUNT

PEAKSOFT

QUICKSILVA

RICHARD SHEPHERD

SOFTWARE PROJECTS

SOFTEK

SOLAR SOFT

TASK SET

TERMINAL

VIRGIN

VISIONS

PRINTERS FOR 64

MONITORS

ACCESSORIES

THE POWER OF 64 CP/M

COMMODORE BUSINESS SOFTWARE

BUSINESS GAMES

UTILITIES

COMMODORE GAMES SOFTWARE

3rd PARTY BUSSINESS SOFTWARE

DIALOG

HANDIC

ADVENTURE INTERNATIONAL

ACCESS

ATARISOFT

BRODERBUND

DATAMOST

DATASOFT

ELECTRONIC ARTS

EPYX

FIRST STAR

FUNSOFT

HAYDEN

INFOCOM

MUSE

SCREENPLAY

SIERRA ON LINE

SEDA CONSUMER PRODUCTS

SIRIUS SOFTWARE

SSI

STRATEGIC SIMULATIONS

SUBLOGIC

TRONIX

the source

64 EXECUTIVE OUTFIT

~~£672.95~~

OUR SUPER LOW PRICE ONLY £399.00

SAVE ABOUT £300 ON RRP

MPS 801 PRINTER ONLY £169

COMMODORE 1541 DISC DRIVE

The ideal upgrade for your 64

FREE with every 1541 Intro to Basic Part I and your choice of Easyfile (powerful database) or Easyscript word processor and six disk based games. Please state your choice

Only £199.90

DEAL ONE

COMMODORE 1541 DISC DRIVE

£150

FREE Software with 1541
Easyscript
Easyfile
Intro to Basic Part I
Six disk based games
Hurry! This offer must end soon

Only £229

DEAL TWO

We endeavour to dispatch within 24 hours on stock items

QUICKSHOT II
Deluxe Joystick Controller

NOW WITH RAPID FIRE FEATURE

ONLY £10.95 inc VAT

REACHES THE SCORES OTHER JOYSTICKS CAN'T

MONEY SAVER!

50p

FREE with every order, five pounds worth of moneysaving vouchers

ORDER BY MAIL
No Stamp Required
COMPUTERAMA
DEPT CHI
FREEPOST
STAFFORD ST16 2BR

ORDER BY TELEPHONE
For ACCESS or VISA 24 hour ORDER HOT-LINE

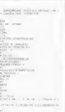
CARRIAGE

Computerama 64

STAFFORD
59 Foregate Street

STOKE ON TRENT
11 Market Square Arcade

SHREWSBURY
13 Castle Gates



◀ the joystick is in the east position (try it!)

Figure 1 contains a simple BASIC subroutine to drive the joystick On return, the variable J contains bits set as follows

bit 0 — 0
bit 1 — 0
bit 2 — north
bit 3 — south
bit 4 — west
bit 5 — fire
bit 6 — 0
bit 7 — east

Hence, the following values may result

0 = centre
4 = north
8 = south
16 = west
128 = east
20 = north-west
24 = south-west
132 = north-east
136 = south-east

adding 32 if the fire button is pressed

The program in Figure 2 loads a machine-code version into the top of memory (any size) This is faster and more compact than BASIC and may be invoked by

SYS 673 J = PEEK(251)

It's worth noting that, if you abort the BASIC program (using RUN/STOP), it's possible to end up with a partly disabled keyboard (type RUN/STOP-RESTORE to cure it) With the machine-code version, this can't happen

Although the above technique does simplify driving of joysticks on the Vic, it still isn't as easy as with some other computers With the 64, for instance, it's only necessary to PEEK a location to read the joystick position Can it be made this simple with the Vic?

The answer is "Yes", by implementing a "background" program Such a program is run every so often, independently of any BASIC program being run at the time The Vic runs some code every 60th of a second to update the time, scan the keyboard, flash the cursor etc Fortunately, the Vic operating system is designed such that an alternative program may also be run at that frequency I have included two variations on this theme

The program in Figure 3 loads a background program which scans the joystick and places the result (in the form used in the program in Figure 1) in location 251($FB) So, to read the joystick use

J = PEEK(251)

at any time

The alternative loaded by the program in Figure 4 places the result in the first variable defined by the BASIC program (which should be an integer) For example

10 J% = 0
20 PRINT J%
30 GOTO 20

prints the joystick value continuously on the screen

The second of the two variations has the advantage of speed, since an integer variable access is faster than a PEEK In both cases the background program is killed by RUN/STOP RESTORE They may be reactivated by SYS 673

At least one other computer (I won't say which, but suffice it to say that it's not a Commodore) has a joystick interface combined with the keyboard scanning circuitry This means that the joystick may be driven like the keyboard, ie with GETs

The program in Figure 5 loads a background routine to achieve a similar effect The nine values in the DATA statement in line 975 represent the ASCII (ie CHR$) codes corresponding to fire, north, south, east west, north-east, north-west, south-east and south west, respectively The fire button takes precedence over the stick directions With the given values, the joystick moves the cursor around, using north, south, east and west, by emulating the cursor control keys

This approach is really my favourite The main advantage is that programs may easily be written to use the joystick or keyboard with no conversions It would, therefore, be simple to add joystick control to a program written to use the keyboard Again, the background program may be killed with RUN/STOP RESTORE and revived with SYS 673

I mentioned earlier that any five switches could be connected to the Vic using the joystick interface This is quite a useful technique since a 5v power supply is also available on the same connector It may be made even more flexible by providing some logic outputs

This is simple, because the VIA may have its connections configured by software to be inputs or outputs, in any combination This is only possible with the four connected to VIA #1, since the other bit is only "borrowed" from the keyboard, when required The program in Figure 6 cycles all four bits (ie pins 1, 2, 3 and 6 of the connector) between logic 0 and 1, with a period of about a second ■

```
FIG.4 - 0ACKGROUND JOYSTICK DRIVER (MK.2
), USE LOADER AND INSTALLER FROM FIG.3
1000 DATAA9,7F,8D,22,91,AD,11,91,49,FF
1010 DATA29,3C,85,F0,AD,20,91,49,FF,29,0
0
1020 DATA05,F0,A0,03,91,2D,A9,FF
1030 DATA8D,22,91,4C,0F,EA,xx
```

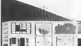
```
FIG 5 - KEYBOARD EMULATION JOYSTICK DRIV
FR, USE LOADER AND INSTALLER FROM FIG.3
65 N=N-22
140 FORA=673TO694
975 DATA13,91,11,1D,9D,00,00,00,00
1000 DATAA9,7F,BD,22,91,AD,11,91,49,FF
1010 DATA29,3C,85,FB,AD,20,91,49,FF
1020 DATA29,B0,05,FB,B5,FB,A9,FF,BD,22,9
1
1030 DATAA0,00,A5,FB,29,20,D0,2D,A5,FB
1040 DATACB,C9,04,F0,26,CB,C9,0B,F0,21
1050 DATACB,C9,B0,F0,1C,CB,C9,10,F0,17
1060 DATACB,C9,B4,F0,12,CB,C9,14,F0,0D
1070 DATACB,C9,BB,F0,0B,CB,C9,18,F0,03
1080 DATA4C,BF,EA,B9,AE,02,8D,77,02
1090 DATAA9,01,B5,C6,4C,BF,EA,xx
```

```
FIG.6-JOYSTICK'OUTPUT'
DEMONSTRATION PROGRAM
 10 POKE37139,60
 20 POKE37137,60
 30 FORI=1TO500:NEXTI
 40 POKE37137,0
 50 FORI=1TO500:NEXTI
 60 GOTO20
```

Soft *Hits*

Punishing the pixels and bashing the bytes of all the new games

On the wing



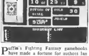
A flight simulator for people who can't stand flight simulators Having attempted the impossible Sublogic Flight Simulator 2, and ploughed into the ground many a time with Digital Integration's Fighter Pilot, I'm just as relieved as anyone to see a flight simulator stripped of its complexities

In **Wing Commander** you must pilot your plane to a confrontation with enemy bombers intent on destroying important civian and military targets With the help of a radar map, a cleverly represented scanner, and various on-screen altitude, condition and warning displays, you can get the baddies in your sights and have the pleasure of blasting them out of the skies

Not too complex graphically, but a great game to play at Christmas Really good for younger players, and not bad for old gnarled ones like me

Program Wing Commander, 64
Supplier Creative Sparks
Price £7 95
Graphics ★★★★★★
Sonics ★★★★★
Gameplay ★★★★★★

Puffed out?



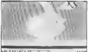
Puffin's Fighting Fantasy gamebooks have made a fortune for authors Ian Livingstone and Steve Jackson, and have made me very jealous (I had the idea years ago, but they beat me to it) You take on the role of a fearless adventurer, and with rolls of a dice and choices selected from a small menu, you make your way through the adventure, either achieving your end or meeting your doom along the way

The books are excellent, but it is a weakness fo the Puffic software packages that they stick too closely to the same format This means that you have to wade through reams of text before you come to the point where you have to make a decision, and even when you make a choice all that really happens is that you see a mediocre picture of your assailant and watch simulated dice roll

If you've got the books, the software doesn't add much to the fun

Program Puffin Fighting Fantasy Software
Supplier Puffin Books
Price £5 50 tape, £6 95 with book
Graphics ★★★★★
Sonics ★★
Gameplay ★★★★

Carted away



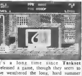
This could have been a good idea, but Activision must get used to the idea that the general standard of computer games should be much higher than that of videocartridges In this one you pilot a fighter/bomber, seen from above as it makes its way along a narrow valley Bridges must be knocked out, tanks and enemy fighters avoided or zapped, and various hazards such as balloons and battleships dealt with

You can start at any point in the game, and there are various skill levels You must destroy or fly over fuel dumps to refuel — a bizarre and illogical game feature, it's always seemd to me — and that's about it

This is one case where although the game is enjoyable to play, it's despite the graphics and sound, which are rudimentary, rather than because of them

Program River Raid, 64
Supplier Activision
Price £9 99
Graphics ★★★★
Sonics ★★★★
Gameplay ★★★★★★★

Gnurds



It's a long time since **Taskset** released a game, though they seem to have weathered the long, hard summer well

Poster Paster isn't their best, but it's still way ahead of many competitors

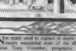
Bill Stickets, Poster Paster extraordinaire, must manoeuvre ladders, posters and gluepot through the streets of — Bridlington? — flicking paste at attacking Gnurds, Wazzocks and Drain Brains The difficult bit is climbing the ladder and sticking your bits of poster up in the right order There's a brilliant unscrolling effect as the poster hangs itself, and having achieved one success you have to move on to the next site

As is usual for Taskset, great graphics, whacky music and a bizarre sense of humour Watch out for **Seaside Special**, too — it promises to be even better

(PS — Gnurds look like teapots — or are those the Wazzocks?)

Program Poster Paster, 64

One-way ticket to doom



Not much need to explain in depth the deeply wonderful style of the illustrious Tony Crowther, progenitor of **Monty Mole, Potty Pigeon** and **Blagger.** In fact **Suicide Express** is derived from his **Alligata game Loco**, but is ten times better — faster, more violent and graphically stunning

You guide a futuristic monorail car along a complex of tracks, fighting off attacks from exploding drones, fighter ships and marvellous revolving flying saucers Incorporating music by Sky, software-generated speech and zippy sound effects, Suicide Express scores tens straight along the line. If you can think of a good reason not to buy this one, I d jolly well like to hear it

Program: Suicide Express, 64
Supplier: Gremlin Graphics
Price: £7 95
Graphics: ★★★★★★★★★★
Sonics: ★★★★★★★★★★
Gameplay: ★★★★★★★★★★

Supplier: Taskset, 13 High Street, Bridlington
Price: £6.90 on cassette, £9.99 disk
Graphics: ★★★★★★★★
Sonics: ★★★★★★★★
Gameplay: ★★★★★★★

Nest is best

AMMO GIRL BOY TIME CLAW ANGLE RESCUE

This one was a stunner when it came out on the Spectrum, but like so many other games seems somehow disappointing on the 64.

The 3-D effects are good, depicting a mysterious, ruined city inhabited by marauding ants. You can choose your point of view, switching from one angle to another so that you never lose sight of the protagonists as they roam the city. You can also choose your sex, which is a praiseworthy gimmick from the point of view of the two or three girls who play computer games.

Armed with grenades your explore the city, searching for your beloved and bombing the ants. The Spectrum version of the game contained all sorts of surprises — hidden ammunition caches, secret rooms and so on — whether the 64 version has the same, time alone will tell. Certainly worth having, though not as outstanding now as it might have been had it come out 6 months ago.

Program: Ant Attack, 64
Supplier: Quicksilva
Price: £8.95
Graphics: ★★★★★★★★
Sonics: ★★★★★
Gameplay: ★★★★★★★★★

"'Ello, 'ello!"

PC Fuzz is a surreal arcade romp featuring a rozzer on a unicycle, flinging guided truncheons at masked robbers planning to spirit away the loot tied to balloons, while punks on pogo sticks bounce through the streets trying to knock our hero off his unicycle, and getaway cars and drunken citizens weave around just to confuse matters further.

If that's the kind of game you like — you'll like this one!

Program: PC Fuzz, 64
Supplier: Anirog
Price: £7.95
Graphics: ★★★★★★
Sonics: ★★★★★★
Gameplay: ★★★★★★

Snappy

Alligata has been responsible for lots of good stuff, but having lost Tony Crowther (of great reknown), **Rocket Roger** looks comparatively limp. It isn't though — it's well worth checking out. It's all the usual business — spaceman with jetpack and laser gun, flying through a mysterious landscape avoiding laser beams, sliding doors, flying nasties and invisible force fields. Your aim is to collect fuel crystals to recharge your spaceship, and if you delay too long between crystals you'll take a nasty tumble.

There are 99 crystals to collect, so Rocket Roger should keep a few people busy for the months to come.

Program: Rocket Roger, 64
Supplier: Alligata
Price: £7.95
Graphics: ★★★★★★
Sonics: ★★★★★
Gameplay: ★★★★★★

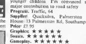
Green Light

Lovely simple idea: control traffic at a London intersection by using the cursor to select which set of traffic lights to change. Too much of a hold-up at any point and you lose.

Multi-level, nice ragtime music and uncomplicated graphics: probably best for younger children. I'm convinced it's a major contribution to road safety.

Program: Traffic, 64
Supplier: Quicksilva, Palmerston Park House, 13 Palmerston Rd, Southampton
Price: £7.95
Graphics: ★★★★★
Sonics: ★★★★★★
Gameplay: ★★★★★★

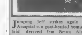
Genuine



The original and genuine, and in many ways a disappointment compared to Dynavision's **Havoc**.

As you will know from countless rip-off versions, **Zaxxon** features a 45 degree perspective scrolling landscape, over which your fighter flies, with full left-right-

Around the horn



Jumping Jeff strikes again. An Ancipital is a goat-headed homunculoid derived fram Brian Aldiss' **Helliconia Spring**. In this case your little sprite must negotiate a 10×10 maze inhabited by the usual loony collection of baddies, in search of the six Key Camels and the six Goats of Power. Described as "an adventure for blast-em-up fiends who hate adventures", **Ancipital** does have more depth than some previous Minter extravaganzas.

There's an enormously complex background sheet included with a handy little map, and hints on how to cope with the electrified walls, bizarre gravitic effects and various zooming sprites.

This one should be great for Minter fans, though it's unlikely to convert unbelievers, may their armpits be infested with the fleas of a thousand camels.

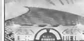
Program: Ancipital, 64
Supplier: Llamasoft
Price: £7.50
Graphics: ★★★★★★★★
Sonics: ★★★★★★★
Gameplay: ★★★★★★★★

up-down control from the joystick Guided missiles, gun emplacements, force fields, space fighters and rockets attempt to blast you out of the sky as you make your way through ever more difficult obstacles to finally confront the Zaxxon robot It's all jolly good fun

Though this version is probably as close as it's possible to get to the original graphically, the sound effects are poor But if you want the genuine article, this is the one to go for

Program Zaxxon, 64
Supplier US Gold
Price £9 99
Graphics ★★★★★★★
Sonics ★★★★
Gameplay ★★★★★★★★

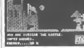
Vroom . . .



Limbic Systems, spin-off from financially-embarrassed Oxford Computer Systems **Turbo 64**, car race game similar to Atari's **Pole Position**, only no other cars on track Software protection system, very annoying Requires you to hit joystick at right time when screen displaying certain colour checked against special numbered grid on insert Nice sound effects in the intro sequence, which seems to go on for ever Not much else to say really

Program Turbo 64
Supplier Limbic
Price T B A
Graphics ★★★★★★★★★
Sonics ★★★★★★
Gameplay ★★★★

Magic!

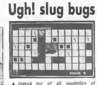


Virgin's corporate socks have certainly been pulled up This latest offering, though hardly stunningly original, is fast, whacky and very polished As the last surviving magician fighting the evil necromancer you must roam the land collecting various weapons, spell books and potions before confronting the baddie at Stonehenge Energy, location and inventory are given at the bottom of the screen

Some colourful graphics as you negotiate the 17 screens, super spooky music and sound effects, and an important element of strategy which makes Sorcery much more than just another multi-screen arcade game

Program Sorcery, 64
Supplier Virgin
Price £6 95
Graphics ★★★★★★★★
Sonics ★★★★★★★★
Gameplay ★★★★★★★★

Ugh! slug bugs



Adapted out of all possibility of recognition from an Atari original **Java Jim** should give a few players late nights

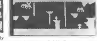
Although it's basically simple — a jungle explorer hopping around a grid of squares, uncovering treasures and avoiding voodoo creatures — it's the little details that make this game so satisfyingly complex

Collecting treasures allows Jim to trade for pieces of a magic boat, and it's the compulsion to complete this vessel that gives the game its playability

What with snake pits to negotiate, Slug Bugs to avoid and black holes to fall into, Java Jim's got the lot Give it a try

Program Java Jim, 64
Supplier Creative Sparks
Price £7 95
Graphics ★★★★★★★
Sonics ★★★★★★★
Gameplay ★★★★★★★

Cave man



The latest from Bubble Bus is not overwhelmingly original, but features a few good baddies (if you see what I mean) and nice title music (Chariots of Fire)

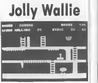
There are 31 screens to explore, and it's the usual business of climbing ropes, zapping man-eating plants and flying goolies, and sticking within the time limit for each cave

Laudably, the number of lives you start with can be set from 1 to 99, and you can start at any cave at a variety of skill levels

Not a classic, but well worth checking out for those of you who like a game which certainly can't be defeated in a single sitting

Program Cave Fighter, 64
Supplier Bubble Bus
Price TBA
Graphics ★★★★★
Sonics ★★★★★
Gameplay ★★★★★

Jolly Wallie



Yet another of the Manic Mole/Miner Wally/Jet Set Blagger stable, but an excellent game for all that Trollie Wallie, who looks like a carnivorous Jaffa orange on legs, leaps around a whacky supermarket collecting goodies and avoiding goolies Every five items he must go back to the checkout to unload

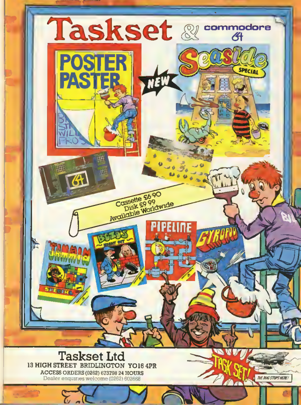
Hidden levers open doors and vicious weebles flop around menacingly Best of all, though, there is a great music score featuring *Popcorn* and *Jean Michel Jarre*'s greatest hits

Good scrolling and a large playing area A must if this sort of game is your bag, or if you like good soundtracks

Program Trollie Wallie, 64
Supplier Interceptor, Lindon House, The Green Tadley Hants
Price £7 cass, £9 disk
Graphics ★★★★★★★★
Sonics ★★★★★★★★
Gameplay ★★★★★★★★

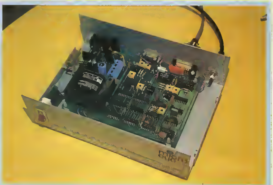
MORE NEXT MONTH

Software companies — send your new releases to Soft Hits, Commodore Horizons, 12 13 Little Newport Street, London WC2R 3LD


Taskset
& commodore 64
POSTER PASTER
NEW
Seaside SPECIAL
JAMMIN' SPECIAL
BOZO'S NIGHT OUT
PIPELINE
GYROPOD
TASK SET!
THE BUG STOPS HERE!

Cassette £6 90
Disk £9 99
Available Worldwide

Taskset Ltd
13 HIGH STREET BRIDLINGTON YO16 4PR
ACCESS ORDERS (0262) 673798 24 HOURS
Dealer enquiries welcome (0262) 602668



Splitting Images

VIDEO DIGITIZING systems, which allow the output of a video camera to be transferred to a computer screen, have been around for many years now, but mainly in the guise of research projects or very up-market graphics systems. Digithurst has now produced a version of its Microsight 1 system which interfaces with the Commodore 64, and which (depending on your affluence), is within reach of home users as well as professionals. The digitizer costs £500, but if you have your own camera, you can expect to knock £150 off the price.

The system supplied for review consisted of a video camera and tripod, the interface box, connecting leads, manual and software. The camera is a black and white ITC Ikegami 40 model. If the name of the manufacturer is unfamiliar to you, then it is worth mentioning that many broadcast organisations use Ikegami hand-held cameras, affectionately known as "Ikkies". The model 40 is at the other end of the range, however.

It contains a Vidicon picture tube and is fitted with an f1.4 lens with a minimum focusing distance of 18 inches. The electronics handle the signal levels, so in order to obtain the best contrast range, it is only necessary to adjust the iris. Although this sounds like an advantage, it would help if gain and black level were adjustable. The connections to the camera are a mains supply and video lead — a BNC type socket feeds the interface via a supplied lead.

The sturdy aluminium box containing the interface electronics, called Microeye, measures 10 by 7 by 3 inches and has one external control — which is only a power switch. A D type socket carries digital signals to and from the box, and mains must be supplied via the Europlug connector. Inside the box the quality of construction is high, with all but one power supply resistor mounted on a double-sided circuit board. The majority of the active components are TTL chips, but at the heart of the interface is an analogue to digital converter IC.

Connecting the interface to the CBM 64 is achieved with a cable that plugs into the user port. But, the lead provided with the review package could be plugged into the computer upside down, as no polarising keys were fitted. On a prototype system this is forgivable, and it will only cost a few pence to correct.

Describing the manual and software that will come with production systems is difficult, since we were provided with pre-production copies. The prototype software was supplied on disk, but production software will be provided on cassette, with the facility for making disk copies. The manual consists of 50-odd pages housed in an A4 folder, but mine related to an earlier system for the PET, with a few pages referring to the 64 version. If the final result is as comprehensive as the PET manual then it will be quite adequate, though not designed for inexperienced computer users.

The way that the system works is both interesting and clever. For readers who are not clear about the make up of a video picture, I will give a brief summary, as this is required knowledge if you want to understand how the Microeye functions. The signal produced by a video camera is a series of lines of picture information interspersed with negative going synchronising pulses. First comes a long pulse that indicates the start of a new field, then a line pulse signals the beginning of each line of video brightness information.

Commencing top left, the image is built up a line at a time from this data. Each line takes 64 microseconds to scan and 287 (and a half, but lets forget about that) lines to build up one field, which takes a fiftieth of a second including the field pulse A second field is required to make up a full video frame The line information comes from between the first set of lines, this method being called interlacing

When the Microeye interface receives a reset signal it waits for the beginning of the next frame When this arrives the A/D converter is fed the brightness level of the beginning of the first line of the picture This is converted to a parallel digital signal that is then passed to the user port of the computer, where software handles the information, storing it for later use Note that up to 8-bit data is available, giving 256 discrete levels, but only four bits are stored by the computer, resulting in 16 different levels One dot of picture has been stored, but this takes time, and by now the video signal is giving values from much further along the line The interface therefore waits for the next line pulse and repeats the process on the first dot of the second line, then the third, fourth and so on Finally, 256 dots having being stored the rest of the field is ignored

When the next field arrives, (which is vertically misplaced because of interlacing, but close enough for these purposes) dots are examined and stored in the same manner as before The only difference is that the sample of video brightness is taken from a little further along the line

After the second field has been digitised, therefore, the computer has two adjacent rows of dot data stored, corresponding to the first two left hand pixels from each line The saga continues — each field is processed until a full width picture has been stored, consisting of 256 by 256 pixels each recorded to 4-bit accuracy

Limited resolution

It is at this point that I must admit to misleading you The description of the interface does not take into account the limited resolution of the 64 "What?" I hear you cry "The 64 has a very high resolution " I agree but not quite enough to handle 256 lines and include some form of grey scaling The software for the 64 version discards alternative pixels and ignores some at the bottom, giving 100 pixels vertically, and also does not bother with every other field, so the horizontal resolution is 128

So much for the theory, how well does it work in practice? With a few reservations, the answer is "very well" Once I had hooked the system up to the computer, I loaded the software from disk The first step is to load and run an initialization program This pokes a good deal of machine code into place and then asks if you have a disc or tape system Once you reply, the second program automatically loads from the correct source and auto runs

After another delay for more machine code installation the 64 switches to the high res mode and clears the screen You now need to refer to the instructions again as no prompts appear on the screen, but operating the software only involves the function keys.

F1 reads in an image from the interface. The VIC chip is switched off, so that the CPU is not slowed down and timings are more accurate For five seconds you are presented with a blank screen, while the data is gathered, and then a 128 by 100 picture is drawn in the bottom left hand corner of the screen This is a binary image with no grey scaling and only takes a few moments to produce

It is at this point that I realized that adjusting the camera was going to be a rather long-winded task So, to speed things up, I looped the video output through the auxillary input of a VCR, allowing me to view the camera image on a TV and adjust it quickly Once a well exposed, recognisable picture was coming from the camera, the results of pressing F1 were more encouraging The image data is only read in by this one function, and is stored in a 12K table

It is this stored picture that is displayed by pressing F3 — the mode for reproducing a larger, shaded display The display is not the full screen width, as the 128 pixels are doubled in width, and that leaves 64 of the computer's 320 available pixels with nothing to do

First results of using F3 were impressive, but could be improved with the aid of the third function, F5 This allows the user to adjust two variables used to produce the image Threshold can have any value between 0 and 255 and affects the overall density of the picture Increasing this value gives a darker image Contrast affects the spacing between shades of grey, and can have a value between 0 and 32 Pressing F5 returns you to the text display, where the computer prompts you for new values

At this point a bug in the software raised its ugly head Even when inputting what I thought were valid values, the software occasionally stopped with an "Illegal Quantity" error message This would not have been too disastrous if I had been able to restart the program, but some of the machine code must have been corrupted by the error, so each time the bug appeared I ended up reloading the program Digithurst points out that the software is still in the prototype stage so I'm sure this will be sorted out

When the values are accepted, you are given a quarter screen view of the effect of changing Threshold and F3 will then display the image using the new variables

The final function, F7, will output the large picture to an Epson-type printer using bit-density graphics Without the correct printer, I was unable to check the results This is the only way, apart from photography, of preserving your masterpiece at present I am assured that the final version of the software will include a tape and disk save and recall function, and that it will also be possible to "export" the image to one of the graphics handling packages for further improvements

Lighting problems

Problems? Lighting 3-D objects so that they are very evenly illuminated and have a narrow contrast range requires time to experiment With a stored contrast range of 16 to 1 and a displayed range of 4 to 1 much experiment was involved in bringing out details Two-dimensional images were fairly easy to store if you only want two-tone results, but if grey scaling is desired then careful selections of subject matter is necessary

A secondary problem was caused by the camera supplied, which suffered from shading in the corners The system does not sample the whole frame — the bottom of the frame must be omitted because there are too many lines in a standard video signal, and the width must be curtailed accordingly to maintain the correct aspect ratio The upshot of this is that the camera shading in the top left corner is accentuated, and often proved impossible to "light out"

Another piece of software that will also be available with the system uses the multi-coloured bit mapped mode of the Commodore 64 Therefore, colours will replace the bit density method of reproduction, with the choice being left to the user In fact, the software situation is really a question of demand If you are unable to change what is supplied to meet your exact needs then Digithurst may well be able to help

One experiment which I tried was taking a still frame from a video recorder My particular machine does not provide a very stable freeze frame, and yet the results were passable

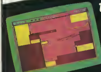
The hardware part of the system presents some very exciting possibilities. With the right software, Microsight will be able to carry out many practical tasks, and home users (with sufficient money!) will find the system a fascinating and absorbing addition to their Commodore 64 ■

Jeff Naylor

Equipment	:	*Microsight*
Use	:	*Video Digitising*
Cost	:	*£499*
Supplier	:	*Digithurst*
Tel	:	*0223 208926*

SUPERSOFT

the name to remember

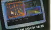


for games

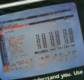
For only £8.95 you can buy a game that's exciting, soothing, and frustratingly addictive – all at the same time! STIX looks so different and sounds so different from all those other games that it will seem like being in another dimension when you sit down to play.

CRAZY KONG £8.95

WILDFIRE £8.95



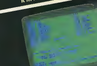
HALLS OF DEATH £8.95



for business

Show your computer who's master with BUSICALC! Spreadsheet programs are used by large and small businesses to juggle with figures, prepare reports and so on. Some are very powerful indeed. The problem is that they're difficult to learn, and tricky to use – which is why we came up with the BUSICALC series.

Whether you choose BUSICALC 1, BUSICALC 2, or BUSICALC 3 you ll gat a program you can underscand – and one that almost seems to understand you. Use it in the home, use it for teaching, use it at work – it'll save you time and monay.



for programmers

MIKRO is a full 6502/6510 ASSEMBLER with the power that professional programmers need, yet so simple to use that we recommend it to beginners! The MIKRO cartridge has many other facilities including editing commands and a machine language monitor, all for £57.50.

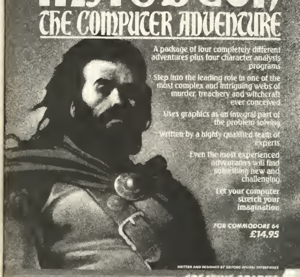
There's much more for the 64 in the SUPERSOFT catalogue. Ask your computer dealer for a copy, or phone 01-861 1166.

The Best 64 Software

SUPERSOFT, Winchester House, Canning Road Wealdstone, Harrow Middlesex, HA3 7SJ Telephone 01-861 1166

MACBETH

THE COMPUTER ADVENTURE



A package of four completely different adventures plus four character analysis programs

Step into the leading role in one of the most complex and intriguing webs of murder, treachery and witchcraft ever conceived

Uses graphics as an integral part of the problem solving

Written by a highly qualified team of experts

Even the most experienced adventurers will find something new and challenging

Let your computer stretch your imagination

FOR COMMODORE 64
£14.95

WRITTEN AND DESIGNED BY OXFORD DIGITAL ENTERPRISES

CREATIVE SPARKS

Available from
All good computer software stockists

Send me (tick as required)

☐ My local stockist's address
☐ Your full list of games
☐ ______ copy/ies of this game

TNEE 293 at £14.95 each	£ ____ p
+ single P&P sum	30p
Total to send	£ ____ p

Method of payment
By cheque or PO (no cash) made payable to **TECS**

☐ By Access or
☐ Barclaycard

Enter card no ________________

Sign below ________________

Credit card sales UK buyers only
Response within 21 days.

Creative Sparks,
Department MO
296 Farnborough Road,
Farnborough, Hampshire, GU14 7NF
Telephone (0252) 518364

Name ________________
Address ________________

CH1064

Red Victor Leader Bandits 2 o'clock high

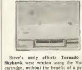
Chris Jenkins interviews Steve Lee, author of Falcon Patrol

WHEN WE talked to Steve Lee in luxurious Sunshine Towers he was going through a period of enforced idleness.

"I've just moved house, and the builders are still working on the estate. Every time they rev up their diggers all the fuses blow, so at the moment my 64's out of action. I'm spending the time fishing!"

In fact, Steve finds that working as a full-time games programmer has its ups and downs. "The neighbours can't make me out — I get some very funny looks when I tell them what I do. They assume because I'm around the house all day that I'm just idle."

It was another period of enforced idleness which encouraged Steve to become a programmer in the first place. "I had a computer science A level — the only one of three that I was any good at — and my earliest experience with computing was using a ZX81. I later moved on to the Vic 20, and started writing games because I was interested in graphics. Unfortunately, I was made redundant, so with nothing better to do I tried selling some games . . . the first was **Tornado**, to Quicksilva."



Steve's early efforts **Tornado** and **Skyhawk** were written using the Vicmon cartridge, without the benefit of a printer or disk drive. "Everything was written down on paper," Steve recalls, "but I was very pleased with the results. My next game, **Mission Mercury**, included a "sprite" routine on the unexpanded Vic. That's its main claim to fame. It was very much a version of **Lunar Rescue** — all the games house had one — and Virgin offered me a contract based on it. By that time I'd got hold of a 64, one of the first in the country, and I was learning how to use it, which was hard work because I didn't have full documentation. But working that way I got to know the machine very well!"

Steve's first 64 game, **Falcon Patrol**, became an instant classic, and set a precedent for Virgin Games — people actually liked it. "When Virgin went into the games business people accused them of hyping their products, because they were a record company. I don't think it was ever that bad, and in any case the situation's quite different now — if you look at the ads you'll see that they're purely descriptive, none of this 'mega-game' and 'synergy' stuff."

Falcon Patrol was shown with great success at the American Consumer Electronics Show, and went on to become one of Virgin's best sellers. "In fact, although I haven't made a fortune from programming, **Falcon Patrol** did finance my move to the new house. Now that Virgin have cut the price to £2.99, they're selling huge quantities mail order, and I get the same payment from a £2.99 mail order sale as I would from a £6.95 shop sale."

Falcon Patrol is arguably a **Defender** variant, but there are crucial differences. Firstly, the background is so detailed that the game is worth seeing just to watch it scroll by. Secondly, there is a certain amount of strategy involved in using your radar display to creep behind the enemy fighters and blast them before they can blast you, then in landing to refuel and re-arm before the next wave comes along. "I wouldn't write a straight shoot-'em-up without an element of strategy", says Steve, "it just wouldn't interest me."

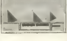
If there was a problem with FP1, it was that you can stooge around chasing enemy fighters for long minutes without catching them, just running out of fuel and watching the landscape scroll by. However, in incorporating the sideways scroll techniques from **Tornado**, and the attention to detail born of Steve's interest in graphics, **Falcon Patrol** made a big hit. Virgin considered ideas for a sequel immediately, but Steve's next effort was on an entirely different track.

"I wanted to do a maze game, but I also wanted to add an element of humour to offset the violence! So I came up with **Hideous Bill and the Gi-Gants.**"

Hideous Bill is a sort of anti-hero version of Indiana Jones. "In another context he could be a wally," says Steve, "but I like him. I might even use him in another game. In fact he's based on a mythical character from my youth. A bunch of my friends had T-shirts printed up with 'Hideous Bill Lee' and so on — we were all Hideous Bills. I had been playing around with a sprite editor package, and came up with the image of an ant. It was just one of lots of ideas — I'd like to do something involving skeletons — but it was the basis of Hideous Bill."

Hideous Bill's history is well documented in the game's insert, written by Steve's brother. In this adventure his mission is to rescue his beloved Greta from the clutches of the Gi-Gants. In the first screen he had to circumnavigate a maze, smashing eggs and avoiding the ants. In the second there are hidden levers which must be picked up in order to open the door to the next level, and a can of baked beans which restores Bill's strength. The third screen is a spiral which Bill must traverse by knocking holes in the wall with his head, so that he can take refuge from the marauding ants. Should he rescue Greta, there's a three-minute cartoon sequence which ends with the unfortunate girl being kidnapped again, and the whole thing restarts. Hideous Bill, hero of the game Steve has written for this month's issue of *Commodore Horizons*, may return in Steve's next game, but for the moment let's leave him to the ants.

Steve's latest production is **Falcon Patrol 2**. "We thought for a long time about how we could do a sequel. I designed the background, which was substantially the same as the original, but with more detail. Then one of the other programmers on Virgin's team looked at it and enlarged the scale of some of the buildings, and added the pyramids . . . it now looks quite different to my original design. I now have things like the title screen and the high-score screen worked out, so there wasn't much effort required on that side of things. My brother Dave wrote the music. We use a



TEAC Portastudio and a **Korg Mono/Poly** to work out the tunes, then I use **Synthi 64** and a routine I've written myself to dump the music data into my program. One thing you've got to say about the 64 is that the sounds are better than the graphics,

although the filters on the SID chip can be a bit unreliable ''

A lot of work on **Falcon Patrol 2** went into the sprites. ''I didn't use bit map mode because it uses up a lot of memory. The background is all user-defined graphics, and the helicopters and flak are sprites. You'll notice that the flak batteries sometimes stop firing when the helicopters appear — this is because I've stolen the sprites. Games like **Revenge of the Mutant Camels** use only eight sprites, though it looks like there are more. I experimented with routines to create more sprites — you could have 255 quite easily, but due to the interrupt structure they could only move horizontally. This would be all right for a game like **Frogger**, but not much good in something like **Falcon Patrol**.

''I tried to write a routine which would use 16 sprites, using just the standard eight but turning them on and off with the interrupts. It didn't work out because the results were too flickery. On the Spectrum you can define any number of ''sprites'' you like, but the problem with the machine is the colour clashes.

''Another idea I experimented with on FP2 was tanks on the ground, but the spective requirements with the sprite priorities made it all too complicated. I'd rather take a few ideas to their limit than try to cram in too many, so I just used the ground based flak batteries and radar jammers.

''The tactics for FP2 are quite different to those in FP1, you can't just come up on the enemy from behind. The helicopters move more randomly. In fact there are 32 variables between levels — some of them are quite subtle, others more obvious, like the height at which the flak batteries can hit you. At levels 8 and 9 there's a lot more flak — you can just about ignore it in the early levels.

''I'm not much of a games player — the highest score I've got on FP2 is 4000. I'm just not motivated I suppose.

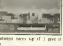
''My brother Robert designed the aircraft in FP2, and the way it banks and turns. Since I don't see many other games it's a great help to have the opinions of my brothers and the other Virgin programmers — they see and play everything going. I like a few games — I bought a Spectrum just to play **Fighter Pilot**, and I like **International Soccer** and some of Jeff Minter's games on the 64. But I couldn't write something like Virgin's Spectrum game **StrangeLoop** — it just wouldn't hold my interest screen after screen. I've got lots of ideas, though, that might be suitable for one of the Virgin programmers — something about lumberjacks trying to keep the logs from blocking the stream, or another idea I had was a steam engine simulator, just like a flight simulator only with a firebox and brakes and so on.''

FALCON PATROL 2
FP II
COMMODORE 64

Though Steve's seen the new Commodore machines, he doesn't regard them as games playing micros. ''I use my 64 for some business applications, Paperclip helps me to do word processing, and even accounts and spreadsheet work. The Plus/4 might do a good applications machine, but Commodore might do better off dropping the price of the 64. They'll certainly have to consider doing that in the case of the C16, if it's to compete with the Spectrum. The 64 would be just right if the price was a little lower, and if it had better colour resolution. I think ideas like speech synthesis hardware are basically good, but they need a user base before the software houses will take it up. Speech software is good in principle, but you need around 3K per second for reasonably intelligible results — the memory just isn't there.

''I wouldn't break into a game to look at how it's written — firstly there aren't that many I'm interested in, secondly I don't like the idea. I think it's the originality of the concept that makes all the difference. That's why my next game is going to be really unusual — no zapping, no simple single quest, the aim isn't even just to amass points. There are going to be seven or eight characters, one of which the player will control. There's an interactive element, with the other characters trying to stop or help you as you do the job you've set out to do. I think I'll be able to use 40 or 50 screens with a reasonable amount of detail, using some elements repeatedly in different combinations. The main feature is going to be the graphic effects, with zooms and dissolves like in a film. I don't know what you'd call it — it's neither an arcade game nor an adventure — it's probably not even a game as such!

''I work when the mood takes me, sometimes for up to 12 hours at a time. If I don't feel like working I get overwhelmed by guilt eventually and I get back down to it, but it's no good trying to force an idea — something always turns up if I give it long enough.



''Hideous Bill might be the hero of the new game, or maybe not — we'll have to see how it goes. Working with the Virgin team there are always new ideas coming from all directions.'' ■

THE 64 SOFTWARE CENTRE
1 Princeton Street, London WC1
01-430 0954

Business accounts

Sales Ledger (Anagram) d	75.00
Purchase Ledger (Anagram) d	75.00
Sales Ledger (Ramtop) t	14.50
Purchase Ledger (Ramtop) t	14.50
Accounts package (Ramtop) d,t	115.00
Cashbok (Microsimplex) d	172.50
Cashbook (Gemini) d	64.95
Cashbook (Gemini) t	59.95
Final Accounts (Gemini) d	64.95
Final Accounts (Gemini) t	59.95
Inventory 64 (MMS) d	29.95
Stock Control (Gemini) d	24.95
Stock Control (Gemini) t	19.95
Combined Pack No. 1 (Gemini) d	99.95

Home applications

Budgeteer (Adamsoft) t	9.95
Checkbook Manager (Adamsoft) d	14.95
Home Accounts (Gemini) d	24.95
Home Accounts (Gemini) t	19.95
Home Office (Audiogenic) t	14.95
Home Accouents (Fieldmaster) d	29.95

Database systems

Magpie 64 (Audiogenic) d	70.00
Mailpro 64 (Pro Line) d	79.35
Oracle 64 (B I) d	125.00
Practifile 64 (MMS) d	44.50
Simply File 64 (Simple) d	69.00
Superbase 64 (Precision) d	90.00
Figaro 64 (Saxon) d	90.00
Database (Gemini) d	24.95

Spreadsheets

Busicalc (Supersoft) d,t	17.95
Busicalc II (Supersoft) d	91.95
Calcresult Adv (Handic) d	99.00
Easy Calcresult (Handic) d	49.95
Multiplan 64 (Hesware) d	99.95
Practicalc 64 (MMS) d	44.50
Practicalc 64 (MMS) t	39.95

Programmers' Aids & Utilities

BC Basic (Kuma) c	57.50
Cadpack (Adamsoft) d	35.00
Chartpak 64 (Adamsoft) d	24.95
Chipmon (Mr Chip) t	12.50
Forth 64 (Audiogenic) c	29.95
Forth 64 Advanced (Hesware) c	50.00
Graphics Designer (Adamsoft) d	19.95
Graphix 64 (Supersoft) t	11.50
Logo (CBM) d	57.50
Master 64 (Supersoft) d	71.30
Mikro Assembler (Supersoft) c	59.90
Hesmon Monitor (HesWare) c	34.95
Pilot (CBM) d	75.00
Printlink 64 (Supersoft) t	32.20
Quickchart 64 (Adamsoft) t	9.95
Screen Graphics (Adamsoft) d	14.95
Simons Basic (CBM) c	47.50
Sprite Aid (Adamsoft) t	9.95
Stat 64 (Handic) c	29.95
Superdisk Utility (Adamsoft) d	12.50
Synthy 64 (Adamsoft) d	14.95
Turtle Graphics II (HesWare) c	50.00
Ultrabasic 64 (Adamsoft) d	24.95
Ultisynth (Quicksilva) t	14.95
Victree 64 (Supersoft) c	58.35
64 Doctor (MMS) d	19.95
Jetpack Compiler d	39.95
Jetpack Compiler t	14.95
Master Composer (Access) d	44.95
Music Master (Supersoft) d	19.95

d = disk t = tape c = cartridge

ALL IN STOCK NOW — Callers welcome
(10am – 6pm incl Saturdays)

Mail Order Cheque or PO – add £3 for items over £30 others free Credit cards (Access/Visa) phone or write immediate despatch

The 64 Software Centre,
1 Princeton Street, London WC1

Please supply the following items:

1 .... Qty ...... @£ ....
2 .... Qty ...... @£ ....
3 .... Qty ...... @£ ....
4 .... Qty ...... @£ ....
TOTAL £ ....
POSTAGE £ ....
TOTAL £ ....
Name .... Address ....
Visa/Access Card No ....
Date .... Signature ....

Word Processors

Heswriter (Hesware) c	39.95
Paperclip 64 (B I)	98.90
Simply Write 64 (Simple) d	49.00
Simply Write 64 (Simple) t	40.25
Vizawrite 64 (Viza) d	79.95
Vizaspell 64 (Viza) d	59.95
Vizaspell 64 (Viza) c	99.95

Educational & Languages

Essential Italian (Dell) d	18.95
Essential Italian (Dell) t	14.95
Besieged (Sulis) t	9.95
Wordpower (Sulis) t	9.95
Time Traveller (Sulis) t	9.95
Just a Mot (Sulis) t	9.95

various subjects: Callisto, Collins, Commodore etc

War simulations

Battle for Normandy (SS) d	34.95
Knights of the Desert (SS) d	34.95
Eagles (SS) d	34.95
Combat Leader (SS) d	29.95
Tigers in the Snow (SS) d	34.95
[illegible]	[illegible]

Flight simulators

Flight Path 737 (Anirog) t	7.95
Flight Simulator (IFR) d,t	27.00
Flight Simulator II (Sublogic) d	47.50
Solo Flight (US Gold) d,t	14.95
Heathrow (HC) t	7.95
Interdictor Pilot (Supersoft) d	19.95

Business Simulations

Commodities (Blue Chip) d	50.00
Stock Exchange (Blue Chip) d	50.00
Real Estate (Blue Chip) d	50.00

Games

A large assortment in disk, cassette and cartridge.

New users — start here!

*If Santa brought you a Commodore 64 or a Vic 20, you might find yourself sitting in front of your TV watching the cursor flashing, with no idea what to do next. **Sarah Cotton** explains the basics of Basic, and sets you on the road to programming success*

IF YOU are baffled by your Vic 20 or Commodore 64 then this article should be of some assistance. It covers several basic principles of using your computer in an easy to understand way.

When you turn on your computer you will see a blinking square on the screen. This is the CURSOR, which tells you where the next letter will be printed. You can move it about the screen using the keys in the bottom right-hand corner of the keyboard marked CRSR. The left hand one will make the cursor move directly downwards, but if it is used in conjunction with one of the shift keys the cursor moves up. The right hand key controls horizontal movement and again can be used with the shift key.

You can easily change the colour of the cursor. If you type in a few letters you can will see that they appear in the same colour as the cursor. To change colour hold down the CTRL key along with one of the numeric keys. You will notice that the first three letters of the colour are shown on the vertical sections of the keys, BLK = black, PUR = purple, WHT = white, GRN = green, RED = red, BLU = blue, CYN = cyan (light blue), YEL = yellow.

The Commodore 64 also has 8 additional colours, which can be accessed using the Commofore logo key at the bottom left-hand corner instead of CTRL.

Cursor

As well as changing the cursor, you can also alter the colour of the screen and border. For the Vic-20 type the following and then hit the RETURN key

POKE 36879,8 That will give you a completely black screen. Other combinations can be found on page 134 of the supplied manual. On the Commodore 64 you will need to type two lines, each followed by the RETURN key. Firstly type this

POKE 52380,0

That will give you a black border. Now try this

POKE 53281,0

The numbers of the other colours are on page 61 of the users guide.

For both computers you can get back to the original colour by holding down the RUN/STOP and RESTORE keys together.

Try typing in words and graphics until the screen is full. On the vertical faces of most of the keys you will see the ‘PET graphic characters''. To obtain those on the left, use the Commodore log key, and for those on the right employ one of the shift keys. If the screen gets a bit cluttered up hold down the CLR/HOME key and shift simultaneously. Without the shift key this will return the cursor to the top left hand corner.

Make sure that you know where the RETURN key is, as you will be using it a lot in the future. It is employed to enter instructions or information.

To get your computer to work you will need to write a 'PROGRAM' which is really just a set of instructions. The ▶

Program 1

```
10 PRINT HELLO
20 GOTO10
```

Program 2

```
10 PRINT HELLO
20 PRINT12
30 PRINT12*3
40 PRINT12/3
50 PRINT3↑3
60 PRINT3+3
70 PRINT3-3
80 PRINT12;3
90 PRINT12,3
100 PRINT SWORD + FISH
110 PRINT SWORD ;"FISH
120 PRINT DAY , NIGHT
130 PRINT 3+3
```

Table 1

SIGN	FUNCTION
+	ADDITION
-	SUBTRACTION
*	MULTIPLICATION
↑	EXPONENTIATION (TO THE POWER OF)

Program 3

```
10 PRINT
```

◀ program is divided into lines, each with its own individual number When the computer is asked to start the program working it begins at the line with the lowest number and then systematically follows through Type in program one, remembering to hit RETURN after each line The quotation marks ('') can be obtained using the keys 'shift' and '2'. If you make any mistakes then you can use the INST/DEL key to erase any previous characters

Nothing will actually happen yet — the computer has just stored up the program in its memory You can check this by typing LIST followed by the RETURN key. This will display the program lines in numerical order regardless of the order they were typed in When you are ready to get the program working type RUN, but don't forget that RETURN key If you have any difficulties with the program not working check that it is absolutely correct Any lines which are not right can be re typed When you get fed up press the RUN/STOP key

Commands

Now let us see how the program was constructed The lines are numbered 10 and 20 so that there are plenty of gaps in between to add extra commands For example, we would add another line labelled 5 or 17 It doesn't matter how the lines are numbered, so long as the line numbers correspond to the order the program is to be worked

Line 10 prints or displays on the screen the letters within the quotation marks You could change the word 'HELLO' to anything else by re-typing the line. Try this and use 'LIST' to check that the computer has noted your alteration Adding a semicolon (;) after the final quotation mark will produce an interesting effect

Line 20 tells the computer to go back to line 10 and begin again

You can erase any line by typing the appropriate line number followed by the RETURN key Try removing line 20 in our original program

If you want to get rid of an entire program use the command NEW' followed by the RETURN key This should always be used with care — once your program has been erased it cannot be retrieved Always remember to use the 'NEW' command before entering any program from this article to erase any previous program

Try program two Remember to use NEW, the RETURN key and RUN to get everything working properly

Compare the results obtained to the program itself and you will see the different ways in which the print statement works Take note of the different mathematical functions in table 1

You have already seen how to move the cursor and change its colour Now let us build these tricks into a program which will print the word 'HELLO' in black 3 spaces down the screen and 9 spaces in. Start by typing program 3.

After the quotation mark press CTRL and 1 You will see a little square appear

Program 4

```
10 LET T=6
```

Program 5

```
20 LET T=T+6
```

Program 6

```
15 PRINT T
25 PRINT T
```

Program 7

```
10 LET A$= HELLO"
20 PRINTA$
30 GOTO20
```

Program 8

```
10 A$= HELLO
```

Table 2

SYMBOL	MEANING
<	LESS THAN
>	GREATER THAN
=	EQUAL TO
<>	NOT EQUAL TO
>=	GREATER THAN OR EQUAL TO
<=	LESS THAN OR EQUAL TO

Program 9

```
10 T=0
20 PRINT HELLO
30 T-T+1
40 IFT>2THENSTOP
50 GOTO20
```

on the screen which is called a 'control character' It tells the computer to change the colour within the program and not directly as we have done before Follow this with 3 presses of the cursor down key, 9 presses of the cursor right key, the word 'HELLO' and finally a quotation mark Hit RETURN and RUN the program

Variables can be thought of as little boxes within your computer which can hold information The box is given a name so it can be refered to later. For the moment you will be meeting 2 types, firstly variables with names consisting of 1 letter, 2 letters or a letter and a number, for example A, TT, F1 Each of these 'boxes' can only hold one number If we want to put the number 6 in a variable called T this is what we type (see program 4)

Try this short program out. Now let's add 6 to the variable, as shown in program 5

If . . . Then

You will notice that when the print command is used in conjunction with a variable no quotation marks are required The way we have built up this short program also illustrates the importance of leaving plenty of gaps between the line numbers

The second type of variable such as A$, AA$ A1$ consists of letters or letters and numbers followed by a dollar sign These can hold strings/groups of letters and numbers but the numbers cannot directly be used in mathematical calculations Try program 7 You should be familiar with all the commands included

Up till now we have been using the LET statement to put something into a variable, but it is not really necessary Thus we could change line 10 in our last program to that in program 8

Before we see another program using variables let's learn a little about IF THEN statements They can be used in conjunction with variables to set up conditions within programs in the form of 'IF something happens THEN do something else ' Refer to table 2

Now let s try program 9 When it is run 3 HELLO's will be printed on the screen T' is the name given to the variable which means that it can only hold a number.

For . . . Next

Line 10 makes sure that T is set at 0 and each time HELLO is printed the number held in the box is increased by 1 Line 40 checks to see if T is greater than 2 and if it is it automatically stops the program Otherwise it continues to line 50

In the last program we were able to control the number of times an operation was completed Although the program worked well there is a tidier and shorter way of arriving at the same result Try program 10 which employs a FOR NEXT loop

This time you only need 3 short lines I have chosen the variable T again so that you can easily compared this program with our last one

The computer begins at line 10, setting T at 1 HELLO is printed and the ▶

Program 10

```
10 FORT=1TO3
20 PRINT HELLO"
30 NEXTT
```

Program 11

```
10 PRINT"HELLO"
20 FORT=1TO1000:NEXT
30 PRINT"GOODBYE"
```

Program 12

```
10 FORT=1TO88STEP22
20 PRINT HELLO
30 NEXTT
```

Program 13

```
10 FORX=10TO0STEP-1
20 PRINTX
30 NEXTX
```

Program 14

```
10 FORT=1TO10
20 FORX=1TO5
30 PRINT HELLO
40 NEXTT
50 NEXTX
```

Program 15 — Vic 20

```
10 FORX=12TO15
20 FORT=128TO255
30 POKE36878,X
40 POKE36876,T
50 NEXTT
60 NEXTX
70 POKE36876,0
80 FORX=15TO12STEP-1
90 FORT=255TO128STEP-1
100 POKE36878,X
110 POKE36876,T
120 NEXTT
130 NEXTX
140 POKE36878,0
150 POKE36876,0
```

◀ NEXT statement sends the computer back to line 10 T is increased to 2 and the process begins again

When T is 3 and the final HELLO has been printed the NEXT statement sends the computer back to line 10 where T becomes 4 As it is now out of its limits, the program jumps to the line after the NEXT statement or, if there are no more lines, finishes

Loops

It is often useful to stop a program in the middle of running it for a short time, for example to give a user time to read some instructions See program 11

Line 20 creates the delay. The program sticks here until T reaches 1000 You will also notice that there is more than one command on this line, each separated by a colon ( )

So far the variables in any of the FOR NEXT loops have only increased by 1 each time This can be altered as in program 12.

This time the variable increased by 22 each time and HELLO was printed 5 and not 88 times It is also possible to have negative steps as in program 13

At first sight program 14 might appear perfectly correct, but in fact the loops have been incorrectly 'nested' The T loops was created first, so its NEXT statement should come last Therefore lines 40 and 50 need to be exchanged Once corrected the program will print the word HELLO 50 times The X loop prints NELLO 5 times and the T loop repeats this a further 10 times

The nesting of loops is a technique frequently required when making sound effects Even if you don't yet know how to use your computer's sound facility try the appropriate program, 15(a) for the Vic-20 or 15(b) for the Commodore 64

The INPUT command is used to obtain information in the form of letters or numbers from the program user Try program 16

REMarks

When a question mark appears answer the question and then press RETURN The variable A$ holds your name and T your age You can then use this string variable information in later stages of your program

REM statements do not effect the way in which programs work They allow the programmer to add notes around the program to explain its workings, etc For example, see program 17

When typing in a program from a book or magazine the REM statements can be omitted so long as you're not removing lines which are referred to elsewhere in the program

Now that you have worked your way through this article, let's end with a final program (18) which includes several of the principles you have learned about

You should now have mastered many of the most essential principles of programming in Commodore Basic, and be ready to incorporate them in your own programs ■

Program 15b — CBM 64

```
5 FORX=1TO3
10 POKE54296,15
20 POKE54277,10
30 POKE54270,0
50 FORV=15TO0STEP-1
60 FORLP=100TO101
65 POKE54276,65
67 POKE54296,V
70 POKE54275,10
80 POKE54274,LP
90 POKE54273,24
100 POKE54272,63
105 POKE54276,0
110 NEXTLP
120 NEXTV
130 NEXTX
```

Program 16

```
5 PRINT WHAT IS YOUR      .
10 INPUT NAME ;A$
20 PRINT HELLO  ;A$; !!!
30 INPUT HOW OLD ARE YOU ;T
40 PRINT NOW I KNOW THAT  ;A$;  IS ";T;
 YEARS OLD.
```

Program 17

```
10 REM HELLO PROGRAM
20 REM BY SARAH COTTON
30 PRINT HELLO :REM PRINT WORD ON SCREEN
40 GOTO30:REM BEGIN AGAIN
```

Program 18

```
10 REM AVERAGES BY S. COTTON
20 REM THIS PROGRAM WAS LISTED ON THE 15
20 PRINTER/PLOTTER WHICH CANNOT HANDLE
30 REM THE NORMAL CONTROL CHARACTERS.
40 REM INSTEAD IT HAS ITS OWN CHARACTERS
.
50 REM  s  =CLR/HOME AND SHIFT
60 REM  Q  -CURSOR DOWN KEY
70 PRINT s  -----AVERAGES-----
80 PRINT QQ HOW MANY NUMBERS DO
90 PRINT Q YOU WANT TO ANALYSE.
100 INPUT QQ     ;N
110 PRINT sQQ PLEASE INPUT THE
120 PRINT Q NUMBERS ONE AFTER
130 PRINT Q EACH OTHER.
140 FORX=1TO1500:NEXTX
150 FORX=1TON
160 INPUT sQQQQQQQQQQ   NUMBER ;A
170 T=T+A
180 NEXTX
190 PRINT sQQQQQQQQQQ   AVERAGE= ;T/N
```

THEIR FEET IN YOUR HANDS.

O.K., so you like to think you can play football like Pele

Well, now's your chance to prove it

With the best football game that's ever been seen outside of Wembley

commodore
COMPUTER SOFTWARE

Not only is International Football startlingly life-like, but it gives you near perfect control over the players

The ball's at their feet, and their feet are in your hands

You can kick the ball and you can dribble it. You can pass it or even head it

And every time you belt the ball into the net, the crowd cheers madly

How often you score depends on how good you are. It also depends on the level at which you choose to play

Altogether there are seven levels. From good amateur to well, good professional

You can choose the easiest level of play, so long as you don't expect a walk-over

Or, if you fancy seeing what it's like to play in a Cup Final, then you can always choose the most difficult level

Or play safe and choose somewhere in between

At each level you're able to play either a friend or the computer

(But be warned, it plays a pretty mean game does the Commodore 64)

You can also choose your team's colours, and those of the opposing team

Which is great

It means you can play for Chelsea one day, and QPR the next. Or Celtic, then Rangers

Imagine that

Or you can play in your own team's colours against Liverpool and thrash them

With International Football you get all the atmosphere of a Cup Final spectacular in your own front room

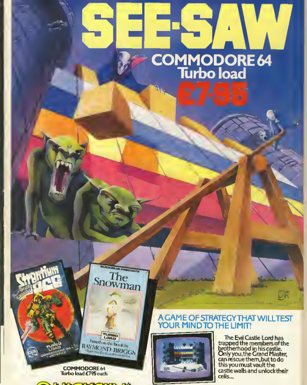
The game is a real test of skill, dexterity and speed, and guaranteed to very quickly drive you football crazy

Like all of our software, International Football has been designed to make the very most of our hardware

Commodore software. It costs no more, even though there's more to it

INTERNATIONAL
SOCCER

INTERNATIONAL FOOTBALL CARTRIDGE £14.99


The Death Planet
Strontium Dog
Turbo Load
Commodore 64
Quicksilva presents
The Snowman
Turbo Load
based on the book by
Raymond Briggs
DR

SEE-SAW

COMMODORE 64
Turbo load
£7·95

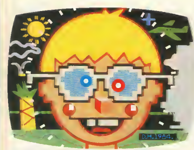
A GAME OF STRATEGY THAT WILL TEST YOUR MIND TO THE LIMIT!

The Evil Castle Lord has trapped the members of the brotherhood in his castle. Only you, the Grand Master, can rescue them, but to do this you must vault the castle walls and unlock their cells...

COMMODORE 64
Turbo load £7.95 each

QUICKSILVA

All titles available from Quicksilva Mail Order,
PO Box 6, Wimborne Dorset BA21 7PY. Tel (0202) 891744.



So you're hardly stumped for choice.

You simply choose your colours and characters, then 'build up' your picture. Just like any other artist.

With 'Art Master' you again get a choice of 121 colour shades.

But this time you can draw whatever shapes you like, creating your very own high resolution masterpiece from a blank screen.

It is even possible to draw circles, and store and then recall a back up picture – which is more than you can do with other graphics programs.

Everyone, from the six year old right up to the 66 year old, will enjoy 'Art Master' and 'Picture Builder'.

Like all of our software, they have been specifically designed to get the best out of Commodore hardware.

That's why you can't choose better.

Commodore software: it costs no more, even though there's more to it.

PICTURE YOURSELF ON T.V.

We're not the only people who think 'Art Master' and 'Picture Builder' are two quite exceptional computer graphics software programs.

Tony and Rolf do, too. Otherwise they'd never have agreed to put their name to them.

commodore
COMPUTER SOFTWARE

With both 'Art Master' and 'Picture Builder' you can create full colour pictures on your own TV screen.

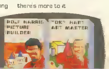
And believe us when we say those pictures will match the best computer graphics you have ever seen.

Anywhere.

The pictures are drawn using either the keyboard or a joystick, and can be stored on either tape or on disk.

With 'Picture Builder' you are presented with a palette of 121 colour shades (more than enough for any budding Michaelangelo).

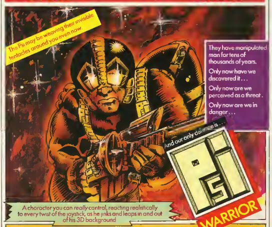
And a collection of character sets totalling over 250 shapes.



PICTURE BUILDER ON CASSETTE ART MASTER ON CASSETTE OR DISK EACH £5.95

BEYOND

CHALLENGING SOFTWARE


The Psi may be weaving their invisible tentacles around you even now.
They have manipulated man for tens of thousands of years.
Only now have we discovered it . . .
Only now are we perceived as a threat .
Only now are we in danger . . .
And our only defence is . . .
Psi
WARRIOR

A character you can *really* control, reacting realistically to every twist of the joystick, as he jinks and leaps in and out of his 3D background

	Quantity	
Please send me **Psi Warrior** (Commodore 64 £9 95)		
From the authors of **Psytron** (Commodore 64 £7 95)		
Order Hotline **0858 34567.** Enquiries **01-837 2899.** Total Price £		

I enclose a Postal Order/Cheque payable to **Beyond,** or charge my credit card

Card Number

Access/Visa (Delete as necessary)

Name

Address

Post Code

Signed

Please rush me details of the **Beyond** Club! ☐

Beyond Competition House, Farndon Road, Market Harborough,
Leicestershire LE19 9NR

Graphics in 3D

Adrian Warman presents a beginners guide to 3D graphics on the 64 with Siman's Basic

ONE OF the most popular pastimes for the owner of a home micro is to attempt to produce some really spectacular graphic displays Unfortunately, it is very rare for even experienced programmers to achieve good results — certainly the sort of pictures produced in many games such as **Beach Head** or **Alice in Videoland** are notable for their rarity just as much as their quality

All too often, attempts to produce graphics fail through lack of thought or preparation The aim of this article is to provide a practical demonstration of how a simple 3-D shape can be manipulated, as well as explaining a little of the theory behind the program

As soon as a programmer has decided to produce a picture of a given object, a whole variety of aspects must be considered What is the object to be portrayed? What is the object expected to do? Under what conditions will the object perform these actions?

Alice in Videoland

The last of these questions may at first sight appear confusing It refers to how much of the image will alter as time passes, and with what amount of detail For example, the famous picture of Alice in the Garden from **Alice in Videoland** is *extremely* detailed, but it is completely static, serving mainly as a background for the game characters and symbols moving across its surface This means that once drawn, the picture will be unaltered Conversely, the air battle scene from **Beach Head** is not static at all, and is expected to interact with the user (for example, aircraft fly overhead or the ships move) As a result, to make the picture 'mobile' and also achieve a reasonable response time, the amount of detail is reduced

What this means in practical terms is that if you want a very fast response time, you cannot have a lot of detail Conversely, if you want a lot of detail, the response time must become increasingly slower This generality applies right the way up through to big mainframe computers, and not just for computer graphics The reason that big computers seem to have the best of both worlds (eg detail and speed, such as shown on commercial flight simulators) is simply that they are very fast with vast memory stores, and often have extra facilities to do selected jobs (the so-called 'dedicated' machines)

The sprites on the Commodore 64 computer do provide an easy way to relocate small quantities of bit-map data at high speed But, any manipulation of the physical data used in the sprite will either require a lot of time, or a large number of sprite patterns which differ from each other only slightly (and hence better performance requires more speed and/or more memory — preferably the former) The conclusion is not to expect too much from the humble home micro

But, let us look at what can be achieved The accompanying program is a very general routine which will move a 3 D wire-frame (ie no hidden lines) representation of a cube through space as it rotates about an axis An elementary knowledge of geometry is assumed, but so long as you understand the concepts of 'origin' and 'co-ordinates', you should be alright.

The first task is to describe the object to the computer This is done by listing the co-ordinates in space of each of the eight corners of the cube For the sake of convenience, the cube is assumed to have the origin in its centre

However, it is not enough just to tell the computer where the points are, we must also provide information as to how they link up to each other This is achieved fairly simply by listing the pairs of points which connect to each other

You should now enter the accompanying program Once you have got this running (conversion notes for other languages are provided) the theory should be easier to follow

The program uses very few machine dependant routines, and those which are used are taken from the Simons' BASIC extension cartridge Only three special commands are used, and they control elementary graphics routines Referring to the accompanying information should help you to convert to other graphics packages or languages which support graphics — such as Pascal or COMAL A brief description of the main sections of the program follows

Lines	Purpose
1040	*The main part of the program starts here A subroutine call is made to load in the data for the cube, and to set up certain parameters to be used in the drawing routines.*
1050-1090	*The main loop of the program The cube will be moved in space on your screen so for each display the new position for the cube must be calculated and the cube itself then drawn*
1060	*This line HIKES 5,0 switches the Commodore 64 to a high resolution display with co-ordinates at (0 0) for top left, and (319 199) for bottom right The numbers represent respectively the information to make foreground points green and the background black*
1100	*Exit the program Some languages will automatically restore the text screen when the program ends, so this method of ending will pause until the user is ready*
1130	*The dimension statement sets up arrays to hold the data describing the cube PTS% holds the co-ordinates of each of the eight corners of the cube LNK% holds the data for each of the 12 edges of the cube*
1140-1160	*Read in the corner co-ordinates*
1170-1190	*Read in the edge data*
1230	*This function will be used to produce the scaling effect Its use will be better understood after reading the theory*
1240	*As the cube moves, it will be rotated about one of its axes. The angle of rotation is set in this line, and is set here to 0 1 radians (about six degrees)*
1280	*This is the most important statement in the program It is responsible for drawing the line (X1, Y1, Z1) — (X2, Y2, Z2) Naturally, a 3 Dimensional line cannot be truly represented on a 2-Dimensional surface (ie the TV screen), and so to fake the effect more distant objects will appear smaller (in just the same way as on a television programme).* *The Simons BASIC command LINE X1 Y1, X2 Y2 1 will draw a line in the current foreground colour from (X1 Y1) to (X2, Y2)*
1320-1400	*This routine will draw the cube Each edge is drawn one at a time For each edge the start (X1, Y1, Z1) position and end (X2, Y2, Z2) position is found, prior to drawing the line*
1440-1480	*This routine will rotate the cube around one of its axes Note that it is the corners that are moved not the edges. This is because the edges still connect the same corners, but the corners are rotating through space*
1510-1560	*The data giving the co-ordinates of each of the corners*
1600-1710	*The data describing each edge Thus in line 1600 the DATA indicates that corner 1 joins to corner 2*
1740-end	*The routine to exit the program. Once the drawing has finished, the border will change to dark grey and the computer will wait for you to press the [RETURN] key*
1780	*The command NRM simply restores the text screen*

3D theory

It is well known that television pictures only appear to be 3-dimensional, an effect achieved by making more distant objects appear smaller The program performs a methodical operation on a given co-ordinate to scale it up or down in size depending on whether it is close to you or far away Since we have to decide on an arbitrary zero, we assume that the screen has X values going from −160 to 160 inclusive as you traverse from left to right, and Y values going from −100 to 100 inclusive as you descend from the top to the bottom of the screen

The Z values are a little more complicated The program assumes that when Z is −300 units, the object is right on the surface of your eye — this means the ▶

PEAKSOFT

CRICKET

NEW!!!

TOTAL
JOYSTICK
CONTROL
OVER
AMAZING
ANIMATED
GRAPHICS!

Tim Love's masterpiece is now available for the CBM 64 - batting, bowling and fielding under total joystick control! Bowl a googly, hit a six, take a catch - you can do it all!

Check with your retailer, clip the coupon, or phone your Access number - all orders despatched within 24 hours.

PEAKSOFT, 48 QUEEN STREET, BALDERTON,
NEWARK, NOTTS. Tel 0636 705230 (24 hrs)

Please rush me Tim Love's Cricket for my Commodore 64. I enclose a cheque or PO for £8.95.
Name..
Address.....................................
....

All games £3.95

RAVE REVIEWS!

Utilities from £3.95

"Here is a real value for money package suited to the average hobbyist"
Commodore User

"The manual is succinct and a cinch to understand" *Commodore User*

100% m/c for Commodore 64

NEW **EDITOR/ASSEMBLER** — Two pass global type. Supports labels of six characters. Directives ORG RMB FCB FDB FCC REM. Hexadecimal arithmetic. Powerful debug Monitor includes single step too plus set break points, selection of useful sub routines and Disassembler £7.95

NEW **BASIC PLUS** — Adds 31 new commands (all available as keywords – no SYS calls required). The new commands are: AT, BCOL, BDR, CIRCLE, CLG, CLS, CRASH, DRAW, FILL, HIRES, INK, LASER, LINE, MOB, MOF, MULT, OFF, OLD, PAPER, PCOL, PING, PLACE, PLOT, PUT, SCOL, SOUND, SPRITE, SSB, TEXT, UNPLOT, ZAP £7.95

NEW **SPRITEMASTER** — This provides quick and easy editing of up to 128 sprites. Both standard and multicoloured sprites are catered for. Animation of sprites is made very easy by the use of the SCAN command. The edited sprites may be saved to tape or disk for use in other programs. Altogether 16 commands are available and the program is menu driven for ease of use £6.95

NEW **ZIPPO** — This saves and loads your Basic or machine code programs 8 times faster. It also provides all your programs with an auto run facility. For only £3.95!

NITE FLIGHT	£3.95
CYBERMEN	£3.95
JELLY BONES	£3.95
VULTURES	£3.95
BONKA	£3.95

Add 50p P&P for orders under £5.00

J. Morrison (Micros) Ltd.
Dept PCW841, 4 Rein Gardens,
Tingley, West Yorkshire WF3 1JR

☎ ORDER NOW!
Telephone (0532) 537507
and use your Access card
SAME DAY DESPATCH

From

GILSOFT

The Welsh Wizards of Adventure

THE QUILL
ADVENTURE WRITER
FOR THE
SPECTRUM 48K
AND
COMMODORE 64

48K SPECTRUM CASSETTE	£14.95
COMMODORE 64 CASSETTE	£14.95
COMMODORE 64 DISK	£19.95

SELECTED TITLES AVAILABLE FROM
W H Smith, Boots, John Menzies, and from
Good Computer Shops Nationwide

Or Direct From Us
By Post or Telephone

THE MAGIC CASTLE
GRYPHON

GILSOFT
30 Hawthorn Road
Barry
South Glamorgan
☎ (0446) 732765

Credit Card Order Line 24 hour service ☎ · (0222) 41361 ext 430

◀ object appears infinitely large because it is so close. A Z value of zero is taken to mean the surface of the screen itself. Hence if you draw a rectangle with co-ordinates at (−160, −100, 0), (−160, 100, 0), (160, 100, 0) and (160, −100, 0) then it will precisely fill the screen. Lastly, as the positive Z values become larger eg 100, 200, 500, 1000 etc, the object will become smaller as it appears to recede from view. Drawing a cube at a distance of 10000 units will produce no more than a point.

Now, all we need to do is to devise a formula for correcting co-ordinates depending on their distance. It is surprisingly easy to produce an approximate formula with sufficient accuracy for our purposes. Assuming that the size is dependent on the Z value, we find that a co-ordinate with true position (X, Y, Z) has an apparent on-screen position of

(X (300/(300+Z)) , Y* (300/(300+Z)))*

A close look at this formula shows several points. Firstly, we have converted a 3-dimensional point (X, Y, Z) into a 2-dimensional point (X', Y') for the TV screen. Secondly, the conversion is achieved simply by multiplying by a factor dependant on Z, namely 300/(300+Z). When Z is −299 the expression evaluates as 300/1 which means all points are magnified 300 times, because they are so close. When Z is zero, the expression gives 300/300 = 1, and hence all points appear normal size. Finally, as Z increases to (say) +300, the evaluation gives 300/600 = 0.5, ie all points are half size, and so on.

This simple expression is the one used to scale the co-ordinates in the program and, owing to its frequent use, is defined as a BASIC function in line 1230. The actual statement for drawing a 3-D line using 2-D is listed in line 1280. Note that the addition of +160 or +100 in the values is to centralise the origin (the normal screen is 320 × 200, and so the centre of the screen is at 160,100).

We now have the ability to describe any line in 3-D. By making the two end points of the line to be the same, we can plot a single point. All we need now is something to draw. This is provided by the accompanying program as it draws a cube moving through space.

Two forms of motion are incorporated. The first is that the cube is moving away from you. This movement is controlled by line 1050 (which sets up the value LOC which ranges from −50 to 200, and is the Z value of the centre of the cube) and lines 1350 and 1380. As LOC increases, the cube is supposed to move away. This is done in the latter two lines by adding LOC to the normal value of the Z value of each corner.

The second form of motion is that the cube is rotating around one of its axes. Strictly, the corners of the cube are rotated around the axis. The program as listed will make the cube appear to rotate in a clockwise direction, with the actual change in angle given by line 1240. If you make ANG in this line negative, the cube will rotate in the opposite direction. Similarly, if ANG is set to zero, the cube will not rotate at all. You may like to observe how the cube appears if it rotates around other axes. Try replacing lines 1450-1470 inclusive with either of the following alternatives:

```
1450  Y=PTS%(X,2)
1460  PTS%(X,2)=INT(PTS%(X,2)*COS
      (ANG) - PTS%(X,3)*SIN(ANG) + 0.5)
1470  PTS%(X,3)=INT(Y*SIN(ANG) +
      PTS%(X,3)*COS(ANG) + 0.5)

1450  Y=PTS%(X,1)
1460  PTS%(X,1)=INT(PTS%(X,1)*COS
      (ANG) + PTS%(X,3)*SIN(ANG) + 0.5)
1470  PTS%(X,3)=INT(- Y*SIN(ANG) +
      PTS%(X,3)*COS(ANG) + 0.5)
```

Each of these alternatives will produce a different type of rotation. For extra effect, try combining two rotations! (Hint: perform one rotation, then perform the next, and so on . . .)

Hopefully, you should now have enough material to try a few experiments for yourself. Even if you do not understand all of the theory, you can see that 3-D effects can be achieved fairly quickly. If you try altering small sections of the program — concentrating on the lines mentioned in the text — you will see what effect they have on the display as it progresses. ■

```
1000 REM 3-D GRAPHICS ROUTINES.
1010 :
1020 REM BY A.WARMAN
1030 :
1040 GOSUB 1130
1050 FOR LOC=-50 TO 200 STEP 25
1060 HIRES 5,0
1070 GOSUB 1320
1080 GOSUB 1440
1090 NEXT LOC
1100 GOTO 1740
1110 :
1120 REM INITIALISE
1130 DIM PTS%(8,3),LNK%(12,2)
1140 FOR X=1 TO 8
1150 READ PTS%(X,1),PTS%(X,2),PTS%(X,3)
1160 NEXT X
1170 FOR X=1 TO 12
1180 READ LNK%(X,1),LNK%(X,2)
1190 NEXT X
1200 POKE 53280,0
1210 POKE 53281,0
1220 PRINT CHR$(50)
1230 DEF FNS(X)=300/(300+X)
1240 ANG=0.1
1250 RETURN
1260 :
1270 REM LINE3D
1280 LINE X1*FNS(Z1)+160,Y1*FNS(Z1)+100,
     X2*FNS(Z2)+160,Y2*FNS(Z2)+100,1
1290 RETURN
1300 :
1310 REM DRAW
1320 FOR X=1 TO 12
1330 X1=PTS%(LNK%(X,1),1)
1340 Y1=PTS%(LNK%(X,1),2)
1350 Z1=PTS%(LNK%(X,1),3)+LOC
1360 X2=PTS%(LNK%(X,2),1)
1370 Y2=PTS%(LNK%(X,2),2)
1380 Z2=PTS%(LNK%(X,2),3)+LOC
1390 GOSUB 1280
1400 NEXT X
1410 RETURN
1420 :
1430 REM ROTATE
1440 FOR X=1 TO 8
1450 Y=PTS%(X,1)
1460 PTS%(X,1)=INT(PTS%(X,1)*COS(ANG)-PTS%
     (X,2)*SIN(ANG)+0.5)
1470 PTS%(X,2)=INT(Y*SIN(ANG)+PTS%(X,2)
     *COS(ANG)+0.5)
1480 NEXT X
1490 RETURN
1500 :
1510 DATA -50,-50,-50
1520 DATA  50,-50,-50
1530 DATA  50, 50,-50
1540 DATA -50, 50,-50
1550 DATA -50,-50, 50
1560 DATA  50,-50, 50
1570 DATA  50, 50, 50
1580 DATA -50, 50, 50
1590 :
1600 DATA 1,2
1610 DATA 2,3
1620 DATA 3,4
1630 DATA 4,1
1640 DATA 1,5
1650 DATA 2,6
1660 DATA 3,7
1670 DATA 4,8
1680 DATA 5,6
1690 DATA 6,7
1700 DATA 7,8
1710 DATA 8,5
1720 :
1730 REM END
1740 POKE 53280,11
1750 GET X$
1760 IF X$<>CHR$(13) THEN GOTO 1750
1770 POKE 53280,0
1780 NRM
1790 END
READY.
```

You'r
my rap
I shoo
In the shops
from October 19th

CLIFF HANGER

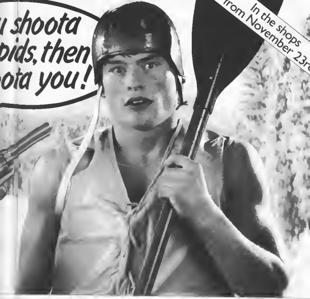
AUTHOR – JAMES DAY ORIGINAL MUSIC – BRIAN DOE

Thrill to the cartoon style action of Cliff Hanger, a really original, Wild West game. As Cliff the hero, you've got to stop the bandito shooting up the canyon. But with its own brand of wacky cartoon action fun, things simply aren't as they seem in Cliff Hanger. For a start, the boulder you throw at the ol' bandito may just come bouncing back at you.

Cliff Hanger incorporates all the elements that have made New Generation games best sellers for the Spectrum, such as original ideas, superb graphics and hilarious happenings – but now it's available first for the Commodore 64.

Featuring 50 separate screens, three levels of difficulty, one or two players scoring, Hall of fame and joystick compatibility or user defined keys, Cliff Hanger is set to be **THE** Commodore games playing sensation. Available frpm any good software store for just **£7.95.**

Selected titles of New Generation Software are available from your local computer store and larger branches of



Shoot the Rapids

AUTHOR – PAUL BUNN

Ever wondered what it would be like to face the fierce white water in a top class canoeist slalom run? Well wonder no more because you can enjoy the fast action thrill of competitive canoeing from the comfort of your own armchair with Shoot the Rapids

It's a game that involves real skill because you must move your joystick to simulate paddling action. You must get through the gates of the slalom course in the fastest time possible, while avoiding the river bank and rocks. There are also extra hazards like rogue speed boats and interfering beavers to worry about.

This multi level game features increasingly difficult river courses with superb graphics and smooth scrolling along the river Qualifying times have to be reached to move onto the next course

With Hall of Fame, one or two player scoring and joystick compatibility, Shoot the Rapids is probably the best sports action simulation game devised to date Available from any good software store for just **£7.95.**

New Generation Software

NEW GENERATION SOFTWARE
FREEPOST Bath BA2 4TD
Tel 0225 316924

GSH

New Generation products are sold according to their terms of trade and conditions of sale

I am the music man, I come from down your way

***David Fox** takes a trip down melody lane with a review of MusiCalc*

HAVING mentioned **MusiCalc** in previous articles on Commodore 64 music, it seems appropriate to take a closer look now, since UK distribution seems well established and additions to the original range are on the way

The 64's powerful SID (Sound Interface Device) chip gives it the capability of making noises comparable to many dedicated music synthesisers, and since there are three sound channels you can also play chords The 64's large memory also means that it has the capability to store huge amounts of note information as DATA statements

The big problem is in accessing all this power through Basic, since nine separate POKEs are needed to fully set a sound register, it's a formidable task to get even a beep out of the 64 It's much wiser to forget Basic and go for one of the many sound synthesis packages now available, of which the most powerful is MusiCalc

MusiCalc is disk based only, and is intended to be an open-ended suite of programs which can be revised, updated and expanded by future packages Most excitingly, there are also plans to incorporate hardware and interface dedicated musical instruments

MusiCalc comes from Waveform of California, and so far consists of three main programs plus two "templates", the function of which will become clear

MusiCalc I, Synthesiser and Sequencer, costs £45 On loading you are presented with a screen display showing all the available sound parameters Using a system of bar graphs and keys, all the parameters — waveshape, ADSR, frequency, filtering, and so on — can be individually controlled for the three voices

Synchronised score

On the right of the display is a colourful grid with moving squares which synchronise with the score currently playing

On loading there are actually 32 scores present as preset files These range from rock to classical, Latin American, novelties and so on Scores are selected from the keyboard, as are the 32 "sound sets" — combinations of different voice settings In other words there are 1024 combinations of score and sound available on loading, which can be altered as you wish, cut down to basic lines for use as backing music, or erased and replaced entirely

The template disks mentioned earlier contain more of these demo files the first selections being Rock and Latin American Needless to say the American idea of Rock and Latin American is pretty laughable, but at least the demos are a good basis to work on

MusiCalc
MusiCalc
MusiCalc

MusiCalc I has six major abilities, which we'll look at in turn The first is sound synthesis, which is carried out straightforwardly with keys used as toggle switches or incrementors

Secondly, composition is carried out on the Score Screen in which an enlarged version of the multicoloured box on the main screen represents the note positions for each of the three voices throughout the composition Scores are written using the cursor to place blocks on the grid, specifying octave and pitch for each one and adjusting tempo appropriately

The third function is playing from the keyboard It's impossible to overcome the inherent difficulties in playing in this manner, but the addition of a mechanical music keyboard is a future possibility The MusiCalc 3 package, Keyboard Maker (which can only be used in conjunction with MusiCalc 1) can be used to define any keyboard parameters, and to set unconventional scales — great for Stockhausen fans

The fourth function of the MusiCalc I package is to select demo scores or load templates There is precious little information in the main manual on how to go about this, and I would hope that this lack would be corrected before MusiCalc hits the shops

"There are 1024 combinations"

The fifth function is the storage of sound/score sets to a blank disk, which means of course that your symphony can be recalled for performance or modification at any time

The last function, and possibly the most exciting one, is the ability to call in other programs to work with MusiCalc I

Again there is an incredible lack of detail in the manuals with which I was provided

The MusiCalc 2 package, for instance, has the ability to print out musical scores (given a suitable printer), and allows MusiCalc to be synchronised with drum machines such as the ubiquitous Roland TR 606 Drumatix But how?! There are also hints that effects units such as digital delays can be tied in MusiCalc 2 costs £31, as does MusiCalc 3

The templates are £15 each, and the next one in the series is The Beat File, a set of drum rhythms ranging from rock to swing

So MusiCalc is an incredibly powerful system, totally open-ended and capable of allowing composition, music writing and sound synthesis with no necessity for musical training or expensive dedicated equipment

The main problems at the moment seem to be with the manuals, which are very full and detailed in most places but seem to miss out on some areas altogether Let's hope the situation is rectified

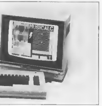
Limitless future

The future of MusiCalc is virtually limitless Although the two American keyboards on show at the Fifth International Commodore Show in June are unlikely to be imported due to prohibitive shipping costs, MusiCalc UK hopes to produce a keyboard for around £80 There's no indication yet whether this will be a full mechanical type or a touch-type

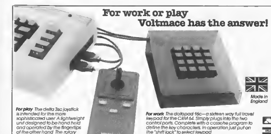
Other projects include a cartridge version of MusiCalc 1, more templates, and, most importantly, a MIDI interface

As explained in previous articles, MIDI is a standard which has been adopted by all the major synthesiser manufacturers, allowing synths, drum machines and sequencers to exchange music and patch information There are already interfaces and software available from SIEL, Sequential Circuits and Rosetti, allowing the 64 to control MIDI fitted equipment, and the prospects for a MIDI version of MusiCalc are very exciting Plans are also afoot to allow two 64's to be connected together, presumably controlled by a mechanical keyboard or MIDI synth, allowing six-note computer polyphony

At the moment MusiCalc is available mail order from MusiCalc UK, The Paradox Group, The Metropolitan, Enfield Road, London N1, 01-241 2448 Retail outlets are being developed, although MusiCalc UK feels that a shop environment is perhaps not the best place to get the feel of the system's possibilities Admittedly the MusiCalc suite is so powerful that it would take hours to get a full demo — but even the briefest listen will I think win you over Electronic Soundmaker & Computer Music, a monthly magazine available from all good newsagents, will be carrying an audio tape including a MusiCalc demo in a forthcoming issue Watch out for it — MusiCalc is well worth hearing ■



For work or play
Voltmace has the answer!



For play The delta 3sc joystick is intended for the more sophisticated user A lightweight unit designed to be hand held and operated by the fingertips of the other hand The rotary slide switches cannot be damaged by excess pressure on the joystick and the fire buttons (choice of three), have been tested for millions of operations.

For work The datapad 16c—a sixteen way full travel keypad for the CBM 64. Simply plugs into the two control ports. Complete with a cassette program to define the key characters. In operation just put on the "shift lock" to select keypad

DATAPAD 16c £29 95
DELTA 3sc JOYSTICK £9.95
Prices include VAT and P&P

Send cheque or P.O. to—
Voltmace Limited
Park Drive
Baldock
Herts
SG7 6EW
Telephone (0462) 894410

Voltmace datapad 16c & delta 3sc

Callers welcome at the factory—Monday to Friday. Dealer terms available.

Press any key to play

*ADSR's filters, waveforms and resonance — **David Fox** discovers how easy it is to bash out a tune with Commodore's budget performance package, the remarkable Music Maker*

RECOGNISING AT a remarkably late date that many 64 users want to do more with their machines than squash aliens, Commodore has in conjunction with the UK's biggest music publishers, Music Sales, come up with the **Music Maker** system

It allows you to use your micro as a musical instrument, without the disadvantages of keying in note information through the QWERTY keyboard, as you must with most of the available music composition software packages (see *Commodore Horizons* May issue) At the same time you don't have to spend money on a full-size mechanical music keyboard, such as the £99 **Echo 1** or the £129 **Autographics Microsound 64.**

The Music Maker is cheap, easy to use and fun, and should sell in its thousands, especially if it gets into the shops in large quantities in time for Christmas Basically, it uses the facilities of the 64's Sound Interface Device — the SID chip — to turn the micro into a musical instrument, comparable to one of the cheaper **Casio** home keyboards

Keyboard

The main feature of the **Music Maker** system is the clip-on mechanical keyboard which sits over the top rows of the 64 and mechanically depresses the QWERTY keys when pressed Also included in the package is a set of stickers, which inexperienced musicians can use to aid key identification, a music book, one of the SFX series from Music Sales, and software on disk or tape

The software, developed by Richard Watts of Milton Keynes Music, gives the 64 many of the capabilities of the immensely popular **Casio VL-Tone.** In the main menu, the function keys can be used to control rhythm select, which gives a choice of four backing rhythm combinations, tempo, bass line, poly play which gives three-note chords, and voice modify, which allows most of the facilities of the SID chip to be used to define new sounds

There is a useful performance feature, common on real synthesizers, by which the pitch of the note played can be bent by pressing on the spacebar Unfortunately it doesn't seem to work in poly mode or allow downwards pitchbend

In Voice Modify mode, the four envelope parameters can be changed with simple use of the function keys Attack, Decay, Sustain and Release — the magic mantra describing the "sound shape" of a voice, the way it fades in, holds at a certain level, then fades out again — can be set from 0 to 15 Waveform sawtooth, triangle, pulse or noises can then be set — these control the sound quality, whether it's thin, dull, low, or in the case of noise merely a wide hissing sound

Pulse width can then be selected in the case of the pulse waveform, which gives further control over the sound quality Filtering — the selection of low or high frequencies to be stressed or removed from the sound — is then selected, as is resonance, the "feedback" or power of the filter

Popular

Having set your desired sound you can enter a tune with one finger, paying no attention to the timing of the notes The SFX music books give many examples of popular tunes, but definitions of "popular" are subjective Elvis Presley's **Wooden Heart** may be some people's idea of music, but give me Klaus Schulze's **Beyreuth Return** any time

Having entered the notes you can enter the timing by tapping any key in the correct rhythm The complete tune can then be played back in perfect timing

Voices or tunes can be saved to tape or disk and reloaded at any time, and there are three demonstration tunes included in the software, **Georgia**, **Snow Waltz**, and, predictably, **When I'm 64.**

It's very nice to see that there's a tuning facility included in the software, you can tune the 64 to a piano, guitar or any synthesizer The system could then be used as a primitive sequencer or drum machine, or as a lead or polysynth at a pitch

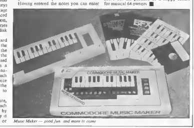
The handbook gives some useful suggestions for sound settings, and incorporates guidance on inputting your 64's sound to a hi-fi system, an excellent idea if you mean to use the system at all seriously

Though the Music Maker system is fun in itself, there are a couple of reservations The two-octave keyboard seems a little fragile, though production models will apparently be more robust There's also no provision for modulation of sounds though a future software package Pro-Synth should make all the capabilities of the SID chip available including modulation, sync ringmod and so on

Hardware

Other packages planned include a composition program which will enable musical notes to be placed on a graphic representation of a music stave This package should also allow compositions to be printed out, in the same way that Waveform's **MusiCalc 2** package does

In fact the Music Maker system should eventually resemble Waveform's more expensive MusiCalc suite of programs With the initial Music Maker package costing only £29 95, it seems certain that many budding computer musicians will find this the ideal introduction to the subject — and with tantalising hints of further Commodore music hardware, perhaps even a MIDI interface which will allow professional-standard synthesizers to be connected to the 64, Commodore holds out the promise of a happy future for musical 64 owners ■



Music Maker — good fun and more to come

LOGIC 3
learn computing series
Learn BASIC programming on the
COMMODORE 64

How to teach your Micro a thing or two

Thousands of home computer owners have yet to discover their microcomputer's potential to help with many of the problems and decisions that come up every day in the home or office

Perhaps you have always promised yourself that you would teach yourself programming, but have been put off by manuals which seem to assume a lifetime spent studying computer science and mathematics Maybe you have looked at other computer books, but have yet to find one which is free of unnecessary jargon or where the program examples bear some relevance to real life and not space invaders.

Relax, your search is over

The 'Learn BASIC' tutorials from Logic 3 are the latest development of a teaching method pioneered by Professor Andrew Colin and perfected by testing on 3 generations of students at Strathclyde University The 'Strathclyde Method' has been translated into 8 languages and used by over 300,000 microcomputer users

'Learn BASIC' is a jargon free, step by step, course to computer programming, which explains everything clearly in English, not computer talk In a matter of hours you will be writing your first programs

'Learn BASIC' is designed for people who want to keep abreast of the computer age, for people who realise that understanding computers is a key to future success at work, at school, and as a parent.

Get 'Learn BASIC' and teach your micro how to be useful! (Available from major branches of W H Smiths, Boots, Laskys, Greens, John Menzies and better computer shops nationwide)

Please send me more information about your

(Tick appropriate box)

'Learn BASIC' tutorials ☐
Logic 3 Spectrum Club ☐
Logic 3 Commodore Club ☐
(64 and VIC owners only)

I have a

Sinclair Spectrum ☐
Commodore 64 ☐
Acorn Electron ☐
BBC Microcomputer ☐
Dragon ☐

LOGIC 3

Name
(BLOCK CAPITALS PLEASE)

Address

(Postcode)

To Logic 3 Ltd., FREEPOST, Mountbatten House, Victoria Street, Windsor SL4 1HE

Save £2.50

Discount Club

Save £2.50

The Commodore Horizons Discount Club is designed to save you money. Simply cut out the coupon at the bottom of the page and send it, together with a cheque or postal order, to.
Commodore Horizons
Discount Club
12-13 Little Newport Street
London WC2R 3LD

This month's special offer, which is only open to Commodore Horizons readers, features five programs for the Commodore 64 from Supersoft

BUSICALC
software from
SUPERSOFT

Free Zoom Monitor

Mikro Assembler

This plug-in cartridge will enable you to write assembler source code as easily as Basic Written by Andrew Trott, it contains a full screen editor, a three pass assembler and can be used with tape or disk A free Zoom machine code monitor (worth £11 50) is included in the package

Usual price
£57 50
Discount Club price
£57 50
(+free Zoom monitor)

Busicalc

This simple electronic spreadsheet can be used for budgeting, financial planning, cash flow forecasts, household accounts and much more You can select any column width from 5 to 18 characters and any number of rows from 18 to 99 All or part of the spreadsheet can be saved to tape or disk

Usual price
£17 95†
Discount Club price
£15 45†

Music Master

If you have ever wanted to use your 64 as an electronic music synthesiser, this is the program for you Envelope, wave form and filter parameters can be defined, while any combination of voices can be played piano fashion A Background Music feature contains 34 pre-programmed rhythms and patterns Music Master, written by Nick Higham also enables you to create a variety of special effects including vibrato and phasing

Usual price
£17 95†
Discount Club price
£15 45†

Interdictar Pilat

The space flight simulator to end all space flight simulators Written by Lawrence Marshall (Commodore Ret'd), this program puts you in charge of an Interdictor Mk III combat patrol craft Your mission is to engage and destroy ships of the Jahdra-Gallan alliance Extremely complex and comprehensive

Usual price
£17.95†
Discount Club price
£15.45†

Save £2.50

Graphics designer

Written entirely in machine code, this program contains a demonstration file complete with a sample character set and sprites In multi-colour mode the number of available colours is doubled, but the number of dots per sprite is halved Works from both keyboard and joystick

Usual price
£9 95†
Discount Club price
£8 45†

†Add £2 for disk

Commodore Horizons Discount Club

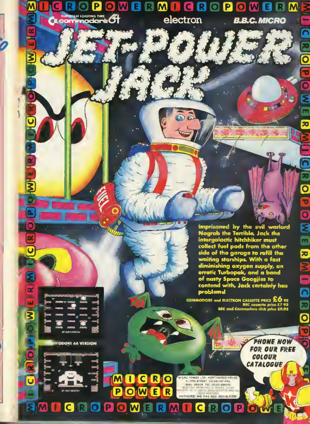
Software	Price Tape	 Disk*	 Cartridge
Mikro Assembler **+ free Zoom Monitor**			☐ £57 50
Busicalc	☐ £15.45	☐ £17 45	
Music Master	☐ £15 45	☐ £17 45	
Interdictor Pilot	☐ £15 45	☐ £17 45	
Graphics Designer	☐ £8 45	☐ £10 45	
Total £		☑ Tick product required	

Name
Address

*If you require a disk, please state type of disk drive

Cut out and post to
Commodore Horizons Discount Club
12-13 Little Newport Street
London WC2R 3LD
Please allow 28 days for delivery

Save £1.50


MICROPOWERMICROPOWERM
SUPERFAST LOADING TIME
commodore 64
electron
B.B.C. MICRO
JET-POWER JACK
FUEL
ODORE 64 VERSION
PHONE NOW FOR OUR FREE COLOUR CATALOGUE
MICRO POWER

Imprisoned by the evil warlord Nogrob the Terrible, Jack the intergalactic hitchhiker must collect fuel pods from the other side of the garage to refill the waiting starships. With a fast diminishing oxygen supply, an erratic Turbopak, and a band of nasty Space Googjies to contend with, Jack certainly has problems!

COMMODORE and ELECTRON CASSETTE PRICE £6.95
BBC cassette price £7.95
BBC and Commodore disk price £9.95

MICRO POWER LTD. NORTHWOOD HOUSE
NORTH STREET LEEDS LS7 2AA
MAIL ORDER TEL (0532) 434006
SELECTIVE BRANCHES OF BOOTS, JOHN
MENZIES, W.H. SMITH, WOOLWORTHS AND ALL
GOOD DEALERS
AUTHORS! WE PAY 20% ROYALTIES!

THE BEST SOFTWARE IN AGES

C-64 ☐ SPECTRUM ☐ BBC ☐ ELECTRON ☐

FANTASIA DIAMOND

Delve deep into the age of fantasy with a host of intriguing characters that may help or hinder your exploration of this dream world!

Retrieve the magnificent Fantasia Diamond recently stolen and rescue Boris the master spy from the imposing fortress and its evil guardian. Talk to the Robot, Violinist and other characters to illicit their help.

An enthralling and sophisticated graphic adventure by Kim Topley for the Spectrum 48K, Commodore 64 BBC Model B* and Acorn Electron*

SRP £7.95

*No graphics on these versions.

HEATHROW ATC

Your challenge in the age of technology is to direct the incoming aircraft at the world's busiest international airport, Heathrow. Monitor the stack displays of altitude heading, velocity and aircraft type. Scan the radar for blips and trails. Develop your skills to tackle emergencies, rogue aircraft, radio and instrument failure.

A highly acclaimed simulation of one of today's most demanding jobs, by Mike Male for any Spectrum, Commodore 64 BBC Model B and Acorn Electron

SRP £7.95

3D LUNATTACK

Do battle with the Seiddab in a futuristic age. Pilot your Z5 Hoverfighter over the craters and around the mountains of the luna landscape. Equipped with the latest indium lazers, duodec missiles, radar navigation and shields penetrate the Seiddab defences and head towards their command base. Destroy the Seiddab Dab Tanks, Aerial Mines, missile silos and Hoverfighters, you must not fail in your mission to drive the Seiddab from their luna base. A stunning 3D Graphic Presentation by Steve Turner for the Spectrum 48K and Commodore 64

SRP £7.95

GSH

HEWSON CONSULTANTS

56A Milton Trading Estate, Milton, Abingdon, Oxon OX14 4RX

As part of our continuing development of innovative software we are always happy to evaluate software sent to us with a view to publication.

Selected items available from Centresoft Dealers and all leading computer software retailers.

WHSMITH Rumbelows John Menzies Spectrum LASKYS Boots HMV

ONLY
£9.95
(INC P&P and VAT)
cascade

THE FABULOUS CASSETTE 50 FROM cascade

VALUE that's out of this world

COMMODORE 64
Only you can save Europe from destruction! It's ROCKET LAUNCH, the thrilling war game that reproduces a European map. More ambitious? Try rescuing your crew under GALACTIC ATTACK! Just two of the great games on your Cassette 50 featuring high resolution and user defined graphics, sprites, sound and music and much much more!

50 GAMES ON ONE CASSETTE

NOW AVAILABLE FOR commodore 64 ELECTRON Atmos DRAGON BBC A/B Spectrum apple ATARI ORIC-1 ZX81 VIC 20

[illegible]

50 GAMES ALSO AVAILABLE FOR VIC 20

WE PAY TOP PRICES FOR TOP QUALITY GAMES

EXPRESS DELIVERY ORDER NOW

Name
Address
Post Code
Country

Dealers & Stockists enquiries welcome

Please send me by return of post, Cassette 50 at £9.95 per tape. I enclose a cheque/postal order for

£ made payable to Cascade Games Ltd

Please debit my No.

COMMODORE 64 ☐ VIC 20 ☐ ORIC-1 ☐ BBC A/B ☐
SPECTRUM ☐ ELECTRON ☐ ZX 81 ☐ APPLE ☐
ATARI ☐ ATMOS ☐ DRAGON ☐ ☑

Cascade Games Ltd
Suite 4, 1-3 Haywra Crescent, Harrogate
North Yorkshire HG1 5BG England
Telephone (0423) 504526

CH 12/84

PLAY

HAVOC

WITH YOUR COMPUTER

"Possibly the ultimate challenge for arcade fans, and a brilliant piece of programming"
Commodore Horizons
Nov 1984

HERE'S A VERY SPECIAL OFFER TO HELP YOU!

FREE £5 VOUCHER WITH EVERY GAME FREE FULL COLOUR A3 POSTER FREE HAVOC MOBILE FREE GIFT SOFTWARE OF AT LEAST £5.95 R.P.

HAVOC for the **CBM 64 — £9.95**

HAVOC for the **SPECTRUM — £7.95**

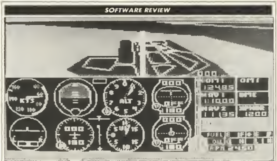
• • •

Available from all leading computer stores and retailers, including W H Smith, Boots, John Menzies, Spectrum Group, etc

To take advantage of this special offer, send cheque or P O to **Dynavision, P O Box 96, Luton LU3 2JP**
Credit card orders to **0582-595222** (24 hrs)

Please send me a copy of HAVOC ☐ CBM 64 ☐ Spectrum

Name
Address



Flight Simulator II takes to the air

*That daring young man in his flying machine **Pete Gerrard** finds that taking off is a great deal easier than landing*

THERE ARE flight simulators, and there are flight simulators, and so far most of the material that has been produced has involved little more than pressing a few buttons, hearing a few engine noises and seeing a couple of dials alter on the screen A real pilot would be very dismayed by the quality of most flight simulator software currently available

Apart, that is, from this one **Flight Simulator II** is a programming tour de force, and everything about the package smacks of a loving care and attention to detail Included in the package is one diskette, one program manual, and one further manual concerning itself with flight physics and aircraft control as it applies both to this program and to flying generally It is only available on disk, due to the complexity of the suite of programs on it (other programs and on screen displays are continually called up from disk, and the random access that this provides couldn't hope to be achieved using tape) You can play, if that's the right word for a program of this standard, using a combination of keyboard and one or two joysticks, although you can get by using the keyboard alone if you wish

Further documentation supplied is impressive There is a flight reference card, telling you what all the main controls do, along with four maps of various airport areas These cover the Chicago, Seattle, Los Angeles, and New York and Boston areas, listing all the major airports in the vicinity Really, the amount of detail that has gone into putting this whole package together is highly commendable

The only thing that was found to be at fault in a first encounter was an accompanying note, detailing some of the features mentioned in the comprehensive manual that do not, in fact, exist Since everything else is covered down to the last detail, it seems a shame that such a factor as the effect of wind turbulence has been omitted However, this is but a minor criticism

Off the ground

To get off the ground and get the program running requires a good few minutes, during which time you see some mighty strange displays on screen as various high resolution displays are called up and discarded in favour of others Throughout the game, the border continually changes colour whenever any new files are called up a nice touch, to let you know that the computer's still doing something

The plane that you are about to pilot is a Piper PA-28-181 Archer II, which is a single engine plane, top speed of around 150 miles per hour, with non retractable gears and equipped with a good set of controls Apparently, this particular plane was chosen because it has a good performance, but is relatively easy to fly

Once the initial few files have loaded, you are asked whether you are using a colour or black and white monitor (screen displays are tempered according to which is in operation) and then whether you wish to go into demo flight mode or test flight Either way you are into the program proper, and can start to actually do a few things with the plane

You start off at Meigs field airport in Chicago, a small airport surrounded by Lake Michigan The on-screen display is basically split up into two sections, the bottom half displaying the control panel, while the top half is reserved for a solid, colour (if the appropriate option is chosen) three dimensional display of what you're seeing out of the front of the craft This display can be altered to give you a view 90 degrees to the left or right, and also a view of what's going on behind you

Also, at this point in the game before we actually get off the ground, many other parameters and options can be chosen and selected, by entering what is referred to as the editor Here, such factors as environment, wind speed, slewing system, difficulty of flight (whether you have a tolerant plane, or a more realistic one), season, and so on, can all be readily altered

There is a further (very large) subprogram within the main set, which turns the program from being a flight simulator into a World War I fighting game but more of that later For now, let's get off the ground

For once you really do get the feeling that you are actually sitting in a plane on a runway, taxiing towards takeoff As the throttle is opened up and you raise the elevator a little the sound that you hear changes accordingly, the view from the front of the aircraft gradually changes also, and the control panel in front of you flickers into life

After a few seconds, that magical moment arrives when you become airborne, and you rapidly realise that you haven't read the manual properly and don't know what on earth (or rather, off it) you're doing This is quite an alarming feeling, because this package is so realistic Once in the air, the control panel shows airspeed, altitude, artificial horizon, slip indicator and turn co-ordinator

Altering the rudder, ailerons, elevators and flaps soon produces a calamity and with a self satisfied smirk the machine prints up the simple word "crash!" to indicate that you've had it No problems here, unlike real life, as you simply start off again

After a few more experiments which usually result in similar disasters, you slowly begin to get the hang of the thing, and attempt something a bit more serious a flight to another airport Not being too adventurous at first, I selected nearby Vermillion County, which seemed like a fairly straightforward flight Before takeoff, you are well advised to consult the map for information on the place you're going to try and get to, since this gives you a wealth of useful information about it, including (of course) where it is in relation to you, in terms of co-ordinates and altitude

Unsuccessful flights

After a few unsuccessful flights like this, as landing is about the most difficult part of flying (well, landing successfully is) either in real life or using such a realistic simulator as this, you can get more daring and attempt longer flights The program, after all, is equipped to cope with the whole world, and although you've only got two fuel tanks on board you can obviously land and re-fuel en route to your destination Landing at some of the more famous airports produces some startling three dimensional displays (the Statue of Liberty!), and throughout I was just so impressed, and so convinced, about the whole thing

The World War 1 fighting section mentioned earlier is probably best [illegible] because a novice at the controls is not going to stand much chance in open warfare Here we have the familiar three dimensional view out of the front window, but one or two things have changed Your radar will now show enemy planes approaching, and gives some indication of their relative position and altitude The plane is now equipped with machine guns, and the sights in the centre of the visual display record what you're aiming at at the time In my case, usually a mountain or two, but I did manage one or two enemy

Your mission here is to destroy the enemy, and ransack their bases On one side of a river live the enemy, on the other side you have your own bases, and it's a good idea to have a recce before declaring open warfare as this gives you the chance of finding out where everything is

There is so much that one could say about a set of programs as good as this that it would take an entire magazine to do justice to it Professional pilots have said that they reckon it to be about the best simulator they've ever seen and although I've never flown a plane in my life (and never will after the disasters encountered while trying to get the hang of this), I would have to agree The review copy was supplied by the 64 Supplies Company of PO Box 19, Whitstable, Kent, which markets Flight Simulator II at £35

Everything that a pilot would expect to find is in here somewhere, and anybody who has been disillusioned about flight simulators in the past should buy this If you want something different, and don't mind spending a two week holiday flying planes in the luxury of your front room, [illegible]

Superbase 64

The natural development for Commodore 64 users

Unlock the full potential of your disk-based Commodore 64, use Superbase 64 – the complete records-handling system that puts business-style power and practicality at your fingertips

Superbase 64 solves a host of filing problems with its easy record formatting, powerful indexing and sorting, extensive outputting options, and its 'Superbasic' programming capability

- Invoices
- Finance & Banking
- Collections
- Recipes
- Personal Filing
- Stock
- Prospects
- Management Accounts
- Car Fleet Records
- and many, many more!

Superbase 64 – The complete information control system for the Commodore 64 includes a simple-to-follow manual

Complete your Commodore 64 – Complete the coupon

More information on Superbase 64 is available from Commodore Dealers, Major Retailers or from Precision Software direct

From the authors of Easy Script

Now with Audio Learning Cassette

Please send me more information on Superbase 64

Name ______________________ Tel ____________

Address ______________________________

______________________________ Age ______

Occupation ______________________________

Precision Software Ltd 6 Park Terrace
Worcester Park Surrey KT4 7JZ
Tel
Telex 8955021
PRECIS G

Precision Software

commodore
Superbase 64
The complete information control system for the Commodore 64.

ZOOM PASCAL Powerful structured compiler producing 6502 m/c UCSD pascal commands data types etc and many additional commands, and an EDITOR £24 95/–

ASSEMBLER 64 Professional development tool! Full assembler/disassembler allowing LABELS VARIABLES PSEUDO OPS and CONTROL COMMANDS £11 99/7 99

DATABASE 64 Menu driven database Max 30000 records 255 bytes/record 15 fields/record CREATE database ADD INSERT DELETE AMEND records SEARCH for records on any field including wild card matching[? *] LOAD/SAVE database to tape/disk £11 99/7 99

ULTRABASIC 64 50 extra commands High res/multi colour (DOT DRAW BOX CIRCLE FILL) Sprites (SPRITE PLACE ROTATE DEF) Sound (SOUND GEN TUNE) Game (PADDLE PEN JOY) Turtle Graphics (TURTLE MOVE TCOLOUR TURN TURNTO) Timer/collisions (CLK SCLK SCOLL BCOLL) Plus many more £15 95/14 95

SYNTHY 64 Turns your 64 into a music & sound synthesizer a piano banjo flute drum and most other instruments Also write your own music £12 50/9 95

SUPER DISK UTILITY 64 Copy 1541 disk in 4 ways-TOTAL BAM FILE APPEND Display BAM directorys Edit/Change/Print and sector Works with 1 drive £12 50/–

CHARTPAK 64 Produces professional high res pie/bar & line charts & graphs Data accepted in many formats £24 95/–

GRAPHICS DESIGNER Menu driven graphics editor High/Low res screens Edit load save print picture Keyboard joystick light pen Features include line fine circle oval triangle 1:1 text caption. £19 95/–

CHECK BOOK MANAGER Computerised cheque balancing Performs many functions Store Edit Amend Delete records Much more £12 50/–

ANATOMY OF THE 1541 DISK DRIVE 300+ page book Technical guide of 1541 ROM disassembly with comments disk commands data storage DOS operation relative records direct access disk structure programs & lots more £14 95

FRENCH 64 – GERMAN 64 Two education packages developed by an education expert Both packages are graded 8 lessons teaching & testing verbs grammer vocabulary spelling & sentences Both packages – £16 95/12 95 £12 95/8 95

COMPUTING 64 Introduction to computers Teaches programming cpu peripherals database operating systems communications & more £12 95/8 95

All prices are DISK TAPE – means unavailable on tape

All programs come with a comprehensive manual

SAE for details overseas add £5.00

DYNAMITE SOFTWARE

BCM 8713, LONDON WC1N 3XX

Superbase 64 TRANSFORMS THE COMMODORE 64 INTO A FULL FEATURED PROFESSIONAL DATABASE SYSTEM, WITH UP TO 1000 CHARACTERS PER RECORD ON UP TO 4 SCREENS AND UP TO 128 ITEMS PER RECORD DEFINABLE AS KEY, TEXT, NUMERIC, CONSTANT RESULT OR DATE, IN FILES OF UP TO 16M CHARACTERS! SUPERBASE 64 EVEN HAS A SPREADSHEET AND CALCULATOR CAPABILITY, CALENDAR FUNCTIONS, EASY INPUT FROM WORDPROCESSOR OR DATA FILES, BOTH MENU-DRIVEN AND PROGRAM OPTIONS, SORTING/SEARCHING, FULLY DEFINABLE OUTPUTS ... SUPERBASE 64 IS ESSENTIAL IF YOU WANT THE MOST FROM YOUR 64! SUPPLIED ON 1541 DISK WITH EXCELLENT TUTORIAL/REFERENCE MANUAL PLUS AUDIO LEARNING TAPE!

OUR PRICE ~~£99.95~~ £88.00

Jetpack YOUR PROGRAMS WILL REALLY TAKE OFF WITH DTL JETPACK 64! 100% COMPATIBLE WITH CBM BASIC, JETPACK COMPILES BASIC PROGRAMS INTO MACHINE CODE, RUNNING UP TO 25 TIMES FASTER ... AND USING UP TO HALF AS MUCH MEMORY, TO GIVE FASTER LOADING, OR BIGGER PROGRAMS! AND IT EVEN ACCEPTS BASIC EXTENSIONS AND MACHINE CODE ROUTINES AS WELL!

OUR PRICE (DISK) ~~£39.95~~ £35.95

Master 64 HAS EVERYTHING YOU NEED FOR PROGRAMMING TO TOP PROFESSIONAL STANDARDS! BASIC IV, MACHINE CODE MONITOR, AND 85 POWERFUL NEW COMMANDS ... INCLUDING TOOLKIT, BUSINESS BASIC, KEYED ACCESS FILES, DISK DATA COMPRESSION, FORMATTABLE SCREEN ZONES, MULTIPLE SCREENS, DATE CONTROL, REPORT GENERATOR, 22-PLACE ARITHMETIC, SCREEN PLOT, SCREEN DUMP, AND MORE ...

ALL FOR ONLY £64.95!

VIZAWRITE 64 VIZAWRITE 64 IS A HIGH-PERFORMANCE, LOW-COST WORD PROCESSOR WITH ON-SCREEN FORMATTING, THAT TAKES FULL ADVANTAGE OF THE 64'S COLOUR, GRAPHICS AND MEMORY FEATURES ... AND SUPPORTS VIRTUALLY ANY PRINTER! WITH A COMPREHENSIVE AND EASY-TO-FOLLOW USER REFERENCE MANUAL, VIZAWRITE IS THE ULTIMATE PERSONAL COMPUTER WORD PROCESSOR! AVAILABLE ON CARTRIDGE (~~£89.95~~ £78), DISK (~~£79.95~~ £68) OR WITH VIZASPELL (~~£99.95~~ £85)

*** WANT IT TOMORROW? *** CALL US TODAY! *** ON 01-546-7256

VIZASTAR	(DISK)	~~£99.95~~	89.00	MULTIPLAN (US)	(DISK)	~~£79.95~~	67.95
VIZASPELL	(DISK)	~~£59.95~~	49.95	PRACTICALC	(DISK)	~~£44.50~~	39.95
EASYSCRIPT	(DISK)	~~£75.00~~	65.00	PRACTICALC	(TAPE)	~~£39.95~~	£34.95
EASYSPELL	(DISK)	~~£50.00~~	41.95	HOMEBASE 1-4	(SUPERBASE)		£17.95
SIMON'S BASIC	(CART)	~~£50.00~~	41.95	STEPPING STONES	(SUPERBASE)		£9.95
FIGARO 64	(DISK)	~~£86.25~~	75.00	PRINTLINK 64	(INTERFACE)		£29.95

PRICES INCLUDE 15% VAT AND ARE CORRECT ON GOING TO PRESS. ORDER BY POST OR PHONE, USING CHEQUE, ACCESS/BARCLAY CARD OR OFFICIAL ORDER. DESPATCH IS BY SAME DAY 1ST CLASS POST, PRE-PAID ORDERS FREE. PRODUCT DATA AVAILABLE ON REQUEST. REF A34

VISA

Calco Software

LAKESIDE HOUSE, KINGSTON HILL, SURREY, KT2 7QT. TEL 01-546-7256

Hideous Bill is back — in Steve Lee's RATWHACK

VIRGIN GAMES has been around for more than a year now, and has matured from a brash, hit-and-miss sort of an affair into a company with a big reputation and a great line-up of games

Virgin's star programmer Steve Lee has written **Hideous Bill in Rat Whack** specially for Commodore Horizons Though it's ages since he's written in Basic he bashed this one out in a few hours — "You could enhance it by adding more sprites to animate Hideous Bill and the rats Apart from that the game has most of the elements of a commercial game, sound effects, skill levels and progressively more difficult stages"

You must guide Hideous Bill through the maze of deadly oscillating rat whoopsies, to stamp on the rats which scuttle from one dustbin to another The game requires a joystick in port one, but the Move Man routine at 4800-4899 could be changed to read the keyboard

Variables include RD, rat directions, T, test for dead rat, CM, pixel counter, DN, direction of pixel movement, SC, score, and LV, lives

Read this issue's profile of Steve for some background on Hideous Bill and Steve's other programs for Virgin ■

```
5 PRINT"♠■■■■       RAT WHACK (C) STEVE LEE 1984"
100 GOSUB4900:GOSUB4100
110 GOSUB4800
120 GOSUB4600
130 GOSUB4500
140 GOSUB4400
150 GOSUB4200
200 GOTO110
4000 REM PROGRESSION
4010 X=INT(5*RND(0))
4015 IFX=0THENY=1231:GOTO4040
4020 IFX=1THENY=1391:GOTO4040
4025 IFX=2THENY=1511:GOTO4040
4030 IFX=3THENY=1631:GOTO4040
4035 IFX=4THENY=1791
4040 X=INT(24*RND(0))
4045 Z=INT(3*RND(0))+73
4050 POKEX+Y,Z
4099 RETURN
4100 REM RESET GAME
4110 PRINT"▌▼▼▼▼          PRESS FIRE TO PLAY "
4120 X=PEEK(56321):IF(XAND16)THEN4120
4125 SC=0:LV=5
4130 GOSUB4300:GOSUB4700:GOSUB4500:GOSUB4270
4199 RETURN
4200 REM CHECK FOR MAN/BKG COLL'N
4210 X=PEEK(53279)
4220 IF(XAND16)=0THEN4299
```

Continued on page 54

```
4222 POKE54290,32:POKE54290,33
4223 FORX=1TO30
4224 POKE54287,X:NEXT:POKE54287,6
4230 IFPEEK(53259)<80THEN4250
4240 POKE53257,60:GOTO4260
4250 POKE53257,220
4260 LV=LV-1:IFLV=0THENGOTO4100
4270 PRINT"█████████████████◥◥◥◥◥◥◥◥◥◥◥◥◥◥◥◥◥◥◥◥◥◥◥◥◥◥◥◥◥◥◥◥◥◥◥◥◥";LV
4280 X=PEEK(53279)
4299 RETURN
4300 REM SET UP SCREEN
4301 PRINT"♣"
4310 CM=0:DM=7
4311 PRINT"███":FORX=0TO17
4312 PRINT"          £"
4313 NEXT
4314 PRINT"◆◆◆◆◆◆◆◆◆◆◆+SCORE◥◥◥◥◥◥◥◥◥◥◥◥◥◥◥◥◥◥◥◥◥◥◥◥◥◥LIVES"
4315 PRINT"┤ "
4320 FORX=1220TO1247STEP3
4322 Y=INT(3*RND(0))+73
4325 POKEX+INT(5*RND(0))+3,Y:NEXT
4330 FORX=1380TO1407STEP3
4332 Y=INT(3*RND(0))+73
4335 POKEX+INT(5*RND(0))+3,Y:NEXT
4350 FORX=1620TO1647STEP3
4352 Y=INT(3*RND(0))+73
4355 POKEX+INT(5*RND(0))+3,Y:NEXT
4360 FORX=1780TO1807STEP3
4362 Y=INT(3*RND(0))+73
4365 POKEX+INT(5*RND(0))+3,Y:NEXT
4399 RETURN
4400 REM MOVE OBSTACLES
4410 IFDM=0THEN4430
4420 CM=CM-1:IFCM=0THENDM=0
4425 GOTO4440
4430 CM=CM+1:IFCM=7THENDM=1
4440 POKE53270,PEEK(53270)AND248ORCM
4499 RETURN
4500 REM CHECK MAN/RAT COLLISIONS
4510 X=PEEK(53278)
4520 IF(XAND48)=48THEN4550
4530 T=1:GOSUB4600
4540 T=0
4550 X=PEEK(53279)
4555 SC=SC+1
4560 PRINT"█████████████████◥";SC
4570 GOSUB4600
4599 RETURN
4600 REM MOVE RAT
4605 POKE54276,64:POKE54276,65
4610 IFRD=1THEN4660
4620 IF(PEEK(53264)AND32)THEN4640
4625 IFPEEK(53258)>251THENPOKE53258,0:POKE53264,44
4630 POKE53258,PEEK(53258)+4:GOTO4685
4640 IF PEEK(53258)>50THENGOTO4625
4650 GOTO4700
4660 IF(PEEK(53264)AND32)THEN4675
4670 IF PEEK(53258)<40THEN4700
4675 IFPEEK(53258)<4THENPOKE53258,255:POKE53264,12
4680 POKE53258,PEEK(53258)-4
4685 IFT=1THEN4605
```

```
4699 RETURN
4700 REM START NEW RAT
4710 IFPEEK(53257)<140THENPOKE53259,228:GOTO4730
4720 POKE53259,50
4730 IF(RND(0))>.5THENRD=0:POKE53258,30:POKE53264,12:POKE2045,252:GOTO4799
4740 RD=1:POKE53258,50:POKE53264,44:POKE2045,253
4799 RETURN
4800 REM MOVE MAN FROM J/S PORT 1
4801 FORY=0TO1
4802 X=PEEK(56321)
4803 IFPEEK(53256)>251THENX=XOR8
4804 IFPEEK(53256)<90THENX=XOR4
4805 IFPEEK(53257)<56THENX=XOR1
4806 IFPEEK(53257)>216THENX=XOR2
4815 IF(XAND8)THEN4825
4820 POKE53256,PEEK(53256)+4
4825 IF(XAND4)THEN4835
4830 POKE53256,PEEK(53256)-4
4835 IF(XAND2)THEN4845
4840 POKE53257,PEEK(53257)+4
4845 IF(XAND1)THEN4860
4850 POKE53257,PEEK(53257)-4
4860 NEXTY
4870 IF(XAND15)=15THEN4899
4880 POKE54283,32:POKE54283,33
4899 RETURN
4900 REM GET SPRITE DATA
4910 FORX=0TO55
4920 READA:POKE16128+X,A:NEXTX
4930 REM SET UP VIDEO CHIP
4940 FORX=0TO47
4950 READA:IFA=255THEN4960
4953 POKE53248+X,A
4955 POKE53248+X,A
4960 NEXTX
4965 REM SPRITE POINTERS
4970 POKE2040,254:POKE2041,254:POKE2042,254:POKE2043,254
4980 POKE2044,255:POKE2045,252
4985 REM SOUND DATA
4990 FORX=0TO24:READA:POKE54272+X,A:NEXT
4995 RETURN
4999 REM RAT RIGHT DATA
5000 DATA 0,0,0,0,0,0,0,0
5010 DATA 0,0,0,0,0,0,0,0
5020 DATA 0,0,0,0,0,64,0,0
5030 DATA 128,0,128,128,121,128,96,253
5040 DATA 224,17,255,176,19,255,248,13
5050 DATA 190,252,6,198,24,0,99,0
5060 DATA0,0,0,0,0,0,0,0
5070 DATA0,3,0,0,0,0,0,0
5099 REM RAT LEFT DATA
5100 DATA0,0,0,0,0,0,0,0
5110 DATA0,0,0,0,0,0,0,0
5120 DATA0,0,0,0,0,0,0,2
5130 DATA1,0,1,1,158,1,7,191
5140 DATA6,13,255,200,31,255,232,63
5150 DATA125,176,24,99,96,0,198,0
5160 DATA0,0,0,0,0,0,0,0
5170 DATA0,0,0,0,0,0,0,0
5199 REM BIN DATA
5200 DATA0,0,0,0,0,0,0,0
5210 DATA0,0,0,0,31,240,0,99
```

Continued on page 56

```
5220 DATA140,0,196,70,0,204,182,0
5230 DATA224,14,0,191,252,0,222,122
5240 DATA0,221,186,0,219,218,0,219
5250 DATA218,0,219,218,0,219,218,0
5260 DATA219,218,0,219,218,0,219,218
5270 DATA0,123,220,0,31,240,0,0
5299 REM MAN DATA
5300 DATA0,84,0,0,84,0,1,84
5310 DATA0,0,184,0,3,248,0,0
5320 DATA252,0,12,20,0,4,85,0
5330 DATA5,85,0,1,85,64,0,20
5340 DATA64,0,20,192,0,60,0,0
5350 DATA40,0,2,168,0,2,168,0
5360 DATA2,8,0,3,8,0,5,8
5370 DATA0,0,12,0,0,20,0,0
5400 REM VIDEO CHIP DATA
5410 DATA28,49,28,227,69,45,69,22
5420 DATA150,220,24,50,0,0,0,0
5430 DATA12,255,255,255,255,63,255,255
5440 DATA 255,255,255,0,16,255,0,0
5450 DATA 0,11,0,0,0,14,7,15
5460 DATA 15,15,15,4,10,0,0,12
5500 REM SOUND CHIP DATA
5510 DATA0,72,0,8,0,33,0
5520 DATA0,8,0,0,32,35,0
5530 DATA0,1,0,0,32,112,240
5540 DATA0,0,0,15
```

SHARDS
PRESENTS
WE CAN'T OUTRUN EM AN' THERE'S TOO MANY OF 'EM!
WE'RE TRAPPED!
UP UP UP TING

Played on 7 full Graphic World Maps

EMPIRE

THWART THE PLANS OF THE EVIL EMPIRE AS IT ATTEMPTS TO CONQUER THE WORLD

£6.95

"An extremely good game — highly recommended" Personal Computer News

"This is a terrific game — visually attractive and highly addictive" Home Computing Weekly

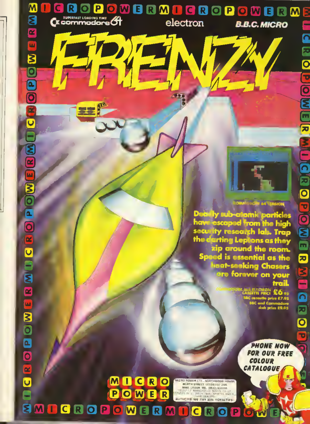
CBM 64

Also on Electron BBC, Dragon and Tandy Colour

Boots Selected Stores

AVAILABLE NOW AT ALL GOOD STOCKISTS or by **MAIL ORDER** (send cheque/PO) from **SHARDS SOFTWARE** Roycraft House Linton Road Barking Essex

OR Telephone through your Access/Visa order to 01-591 7666


SUPERFAST LOADING TIME
commodore 64
electron
B.B.C. MICRO
FRENZY
COMMODORE 64 VERSION
PHONE NOW FOR OUR FREE COLOUR CATALOGUE
MICRO POWER

Deadly sub-atomic particles have escaped from the high security research lab. Trap the darting Leptons as they zip around the room. Speed is essential as the heat-seeking Chasers are forever on your trail.

COMMODORE and ELECTRON CASSETTE PRICE £6.95
BBC cassette price £7.95
BBC and Commodore disk price £9.95

MICRO POWER LTD., NORTHWOOD HOUSE
NORTH STREET, LEEDS LS7 2AA
MAIL ORDER TEL. (0532) 434006
SELECTED BRANCHES OF BOOTS, CO-OP, MENZIES, W. H. SMITH, [illegible] WORTHS AND ALL GOOD DEALERS
AUTHORS! WE PAY 20% ROYALTIES!

Braingames

The tough nuts to crack!

Braingames bring you the most entertaining and fulfilling adventure and strategy games.

Our adventures combine strong story lines, high quality graphics and sound to produce games you will want to play time after time.

Strategy games ranging from the White House to King Arthur's Court, from the oil business to a used car lot, will test your skills and imagination.

For the Commodore 64
Cassette £7.95
Disk £9.95

FAME QUEST

A friendly joust or duel to the death? Kill the dragon, run away or even try to talk to it?

These are some of the questions you will have to answer on your Fame Quest. You enter this world as a lowly knight without sword or armour. By means of your skill and judgement you will accumulate fame (and money!). Given time you may aspire to be the mightiest warrior in the land, but beware — many encounters await you on your Quest.

FAME QUEST

A game of strategy for one player, with full graphics and sound

For the Commodore 64
Cassette £7.95
Disk £9.95

ELECTION TRAIL

ELECTION TRAIL

Run a media campaign in the Western States? Try to raise funds in Texas? Hold a rally in New York?

You are organising the presidential campaign for your candidate and decisions must be made which will make or break his bid for the White House. With everything at stake, you may find it hard to choose between a rally and a campaign tour, a press conference and a public debate.

An exciting and original strategy game for one or two players. Full colour graphics, maps and music make this a must for any aspiring politicians.

For more information on the tough nuts Phone us on Brighton (0273) 608331 NOW

Postal enquiries to :—
BRAINGAMES Amplicon Group
Richmond Road, Brighton East Sussex BN2 3RL
Tel. Brighton (0273) 608331 Telex. 877470 AMPCON G

Braingames is a division of Amplicon Micro Systems Limited

COMPETITION SPECIAL

Two great prizes

Commodore's Christmas presents

AS A Christmas bonus, Commodore UK is offering a **Plus/4 and a C16** as prizes in this special competition.

You'll all have read the reviews of Commodore's two fabulous new home computers. The Plus/4, with its built-in software and compatibility with a wide range of Commodore peripherals, is the ideal home applications machine — and the C16, with its spectacular graphics and easy programming language, is the best introduction to computing, as well as being a powerful games machine.

To win, all you have to do is put in order of merit the various features of the new machines. For instance, if you think the most important features is "Easy programming", then enter C in box One. Then fill in the tie-breaker in an apt, original manner in fifteen words or less, and post your entry to the competition address. If you do not wish to cut your copy of Commodore Horizons, photocopies or neat plain paper copies will be accepted.

Usual competition rules apply. The Editor's judgement is final.

A: Advanced 7501 microprocessor

B: Full size, full stroke Mechanical keyboard

C: Easy programming with Basic 3.5

D: 320x200 pixel screen resolution

E: 121 combinations of colour and luminance level

F: Help key to highlight programming errors

G: Two joystick ports for games and utilities

H: Built-in machine language monitor

1 ☐

2 ☐

3 ☐

4 ☐

5 ☐

6 ☐

7 ☐

8 ☐

NAME ____________________

ADDRESS ____________________

I would like to win
(tick one box)

☐ Plus/4

☐ C16

I want a new Commodore in my Christmas stocking because ____________________

Post to: Commodore Competition, Commodore Horizons,
12/13 Little Newport Street, London WC2R 3LD
Closing date is January 31st

Ingenious...

Leisure Genius presents
COMPUTER
SCRABBLE
For the Commodore 64
'more fun from your micro'

Waddingtons
Leisure Genius presents
COMPUTER
CLUEDO
The Great Detective Game
For the Commodore 64
'more fun from your micro'

Leisure Genius presents
COMPUTER
Kensington
For the Commodore 64
'more fun from your micro'

Leisure Genius presents
COMPUTER
MASTERMIND
For the Commodore 64
'more fun from your micro'

Computer games for people who hate computer games.

Give your joystick a rest,
and your brain a chance with these
family favourites.

Software by...

Leisure Genius®

3 Montagu Row London W1H 1AB

NOW AVAILABLE AT Boots WHSMITH AND AT OTHER LEADING STORES.

Charting your progress

*In the first of a two-part series, **David Lawrence** shows how to create a variety of charts and graphs*

THE C16 is particularly good at displaying information in ways which are more immediately understandable than lists of facts and figures. This article (together with next month's) consists of three programs which will create graphs of one kind or another, both in low and high resolution.

The programs are: Graph which creates a very effective and powerful line graph in high resolution, Piechart which will take a limited amount of data and display it in the form of a circle split into multi-colour segments and Graph II which allows you to create a stunning 3-D barchart.

One of the problems of working within 16K of memory is that high resolution programs will always eat into what is available, leaving very little scope for the manipulation of data in applications programs. In the first **Graph** program, we examine one way round this limitation by creating a program which does not have to devote memory to placing prompts on the screen, storing data in arrays or placing data for storage on to disk or tape. Techniques introduced during the course of the **Graph** program include the flexible use of DATA statements and the use of logical conditions as variables.

Modules 2 1 1 and 2 1 2 hold the data for the graph. Don't be concerned if at this stage you find it difficult to see the relevance of all the figures. Their use will become plain once you have entered and run the program once or twice, and experimented with making some changes.

Commentary

Lines 3030-3050: These lines contain the name which the user wishes to give the graph as a whole, and the labels to be attached to the vertical and horizontal axes. Note that in each case the phrase before the comma in DATA statement is there solely for the convenience of the user and will be ignored by the program — the comma is essential to separate the first phrase from the important information which follows it.

Lines 3060-3070. The two axes of the graph will be divided up into units for ease of reading. The axes will always be the same length, but the user can specify how many units each will be split up into.

Line 3080 If, for example, the graph was meant to be recording tons of wheat produced by a country over a number of years, the user might wish to make each unit on the vertical axis record a unit of 1,000 tons. Rather than make the user divide up the actual figure into units of 1,000 before entering it, the figure in this line allows the units to be specified so that every figure can be entered in full.

Lines 4030-4040: These lines hold the DATA on which the graph will be based. In this example, these figures will produce a smooth, bell shaped curve. Note that there is provision for only one figure for each unit on the horizontal axis, starting at position one, though the whole of the horizontal axis does not have to be used. As many DATA items as desired may be included on each separate line, within the limit of two screen lines for a program line.

Lines 4050-4090 These lines allow more data to be entered, though they are not needed in the test graph presented here. You can use as many data statements as memory will allow, but the information must be terminated by a DATA statement containing the word END. This is the signal to the program that it has reached the end of the DATA to be used for the graph — even if more DATA statements follow.

Module 2 1 3 draws the framework onto which the eventual graph will be placed, complete with the units on the axes and the various labels specified.

Commentary

Lines 1050-1070. The two axes are drawn, a line from near the top left hand corner of the screen to near the bottom left hand corner, continuing at a right-angle across the bottom of the screen to near the bottom right-hand corner.

Line 1080 The C16's data pointer is set to point to the first item of DATA following the start of the module at 6000. This RESTORE will prevent an OUT OF DATA error being generated if the program is started with GOTO. Using RUN sets the pointer to the first item of DATA anyway.

Lines 1090-1110: The labels for the graph as a whole, the horizontal axis and the vertical axis are read from the DATA statements and printed on the screen. In the case of the label for the vertical axis, a loop is used to print the label character by character down the left hand side of the screen.

Note that in each case there are two READ instructions. The first one picks up the phrase *before* the comma in the DATA statement. This is then immediately discarded by READing another string into the same variable, T$.

Modules 2 1 1 and 2 Lines 3000 - 4090

```
3000 REM********************************
3010 REM DATA 1
3020 REM********************************
3030 DATA GRAPH TITLE,TEST
3040 DATA H/AXIS NAME HORIZONAL
3050 DATA V AXIS NAME VERTICAL
3060 DATA UNITS ON H/AXIS,20
3070 DATA UNITS ON V/AXIS 20
3080 DATA AMOUNT PER V/UNIT-10

4000 REM********************************
4010 REM DATA 2
4020 REM********************************
4030 DATA 10 20 40 70 110 140,160 170 175
4040 DATA 175-170 160 140 110 70 40 20 10
4050 DATA END
4060 DATA
4070 DATA
4080 DATA
4090 DATA
```

Line 1120: The number of divisions to be placed on the vertical axis (NV) is read from the next DATA statement. The length of the vertical axis (160 pixels) is then divided by this number to arrive at the length of each division in pixels (LV).

Lines 1130-1150 This loop draws small marks on the vertical axis to record the divisions specified by the user. One thing ▶

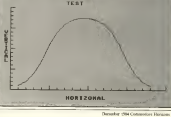


Figure 2.1: Graph

3D COMPUTERS

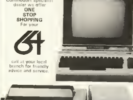
THE HOME COMPUTER SPECIALISTS

Easy Parking at all branches

with more branches
than any other
Commodore specialist
dealer we offer
ONE
STOP
SHOPPING
For your

64

call at your local
branch for friendly
advice and service.



See a complete display of hardware and software to build up your micro system

SOFTWARE

All the best sellers from the top U.K. and U.S.A. software houses, eg.:

LLAMASOFT
DATASOFT
EPYX
INFOCOM
RABBIT
INTERCEPTOR
SUPERSOFT
ON-LINE
ABRASCO

PERIPHERALS

DISCS
PRINTERS
JOYSTICKS
MONITORS B&W/
COLOUR
LIGHTPENS
C2N CASSETTE DECKS

LARGE RANGE OF BOOKS, DISKETTES, CASSETTES & PRINTER PAPER ALWAYS IN STOCK

TOLWORTH
230 Tolworth Rise South,
Tolworth, Surbiton,
Surrey KT5 9NB
Tel: 01 337 4317

SUTTON
30 Station Road,
Belmont, Sutton,
Surrey SM2 6BS
Tel. 01-642 2534

EALING
114 Gunnersbury Avenue
Ealing, London W5 4HB
Tel: 01 992 5855

RICKMANSWORTH
Graystone Works,
The Green, Croxley Green
Rickmansworth,
Herts WD3 3AJ
Tel (0923) 779250

NEWBURY
26 Stanley Road,
Newbury,
Berks, RG14 7PB
Tel: (0635) 30047

LUTON
1 Manor Road,
Caddington, Luton,
Beds LU1 4EE
Tel (0582) 458575

Anger Productions

CBM 64 Software

FLIGHT SIMULATOR Original for 64!
Pilot your aircraft to the airport of your choice in U.K. Recall your position on the map at any time during your flight and experience the thrill of take off, flight and landing.
Joystick preferable **Cassette game £9 95p**

PLAY GOLF
Take up the challenge to play Golf on this 18 hole par 72 course. Play to full PGA Rules and learn the game or improve your handicap at home **Cassette game £7.50p**

YANTZEE
Play this very skilful old Chinese dice game either by yourself or with your family and friends (Up to 4 players). Great family game for Xmas **Cassette game £7 50p**

Order any 2 games and receive our excellent ASSEMBLER **FREE** worth £6 95p

Help yourself to learn how to write, read and copy your own machine code programs

LIFETIME REPLACEMENT [illegible]

To order just complete the coupon and mail it to us with your remittance

Name
Address

Flight £8 95 ☐
Golf £7 50 ☐
Yantzee £7 50 ☐

Any combination of programs available on Disk £2 extra ☐

ANGER PRODUCTIONS 14 The Crest Broxbourne Herts EN10 8DQ

SOPHISTICATED GAMES FOR VIC 20/CBM64

VIC/64 CRICKET Realistic game of tactical skill and luck. Ball by ball commentary with full scorecard and all the major rules of cricket correctly interpreted. Printer/game save facilities.
VIC CRICKET for VIC 20 + 16K 5.99
NEW 64 CRICKET with extra features 6.99

LEAGUE SOCCER League title game for 2-24 players with automatic fixtures, action commentary, results check, scorers, league table, cup draw etc. Printer/game save facilities.
LEAGUE SOCCER for VIC 20 + 16K 5.99
NEW 64 LEAGUE SOCCER with many more features still 6.99

WHODUNNIT 12 guests have gathered for drinks at Murder Manor but one of them has more than drinks on his mind. Addictive and thrilling detective game for 1 to 6 players, with genuinely different game each time.
WHODUNNIT for VIC 20 + 8K or any CBM 64 (state which) 4.99

TOP OF THE POPS Easy to learn game about the music business. For up to 10 players. Includes printer/game save features.
TOP OF THE POPS for VIC 20 + 8K 4.99
NEW 64 TOP OF THE POPS — even bigger and better 5.99

ELECTION NIGHT SPECIAL Lead your own party into the next General Election. A game for 1-3 players. Printer/game save.
ELECTION NIGHT SPECIAL for VIC 20 + 8K 4.99
64 ELECTION NIGHT SPECIAL — bigger and better .... COMING SOON

PARTY 4 Four games to match the progress of your party: MASTERWORD, A DAY AT THE RACES, GAME X (Strip Poker) and CONSEQUENCES. Harmless fun (nothing offensive) but good fun.
VIC PARTY 4 for VIC 20 + 3K or more 5.99
64 PARTY 4 .... COMING SOON

***NEW*: ADULTS ONLY** Fun game for 2-10 broadminded players. Lots of cuddling and kissing, plus many other rewards and forfeits: you never know what you'll end up doing, or with whom! Nothing offensive, but you MUST be fairly broadminded.
ADULTS ONLY for VIC 20 + 16K expansion 5.99
64 ADULTS ONLY .... COMING SOON

DISC VERSIONS AVAILABLE FOR ALL GAMES — £2.00 EXTRA. ALL PRICES INCLUDE (P&P) (UK ONLY). GAMES SOLD SUBJECT TO CONDITIONS OF SALE WHICH ARE AVAILABLE ON REQUEST. PLEASE WRITE OR PHONE FOR DETAILS OF OUR FULL RANGE

SOPHISTICATED GAMES
Dept CH, 27 Queens Rd, KEYNSHAM, Avon BS18 2NQ
Tel: 02756-3427

to make note of here is the expression -4*(I/5 = INT(I/5)), which has the effect of making the mark for each unit bigger than the rest. To understand the expression, you need to know something about the way in which logical conditions are created by the C16.

When the C16's BASIC Interpreter, the extensive machine code program which runs BASIC for you, comes across a condition following an IF, something like A>B, A=B or A<=B it needs to determine whether that condition is true or false before deciding whether to carry out the action specified by the IF statement. Thus

IF A>B THEN GOSUB 1000

will be acted upon if A>B is *true* (eg A=10 and B=9) and ignored if it is false (eg A=[illegible] and B=10). In order to make its decision the condition is evaluated according to the current values of A and B (or whatever variables have been specified) and the condition is given a *value* which is minus one if the condition is true and zero if the condition is false. It is the *value* rather than the condition itself that matters, a fact which you can demonstrate for yourself by conducting the following small test. Enter, in direct mode

A=5(RETURN)

IF A THEN PRINT "TRUE" *(RETURN)*

The result will be that TRUE is printed on the screen since the value following the IF statement is not zero (any non-zero value, positive or negative, will produce the same effect). Now try

[illegible]

IF A THEN PRINT "TRUE" (RETURN)

Module 2.1.4: Lines 2000–2200

```
2000 REM*********************************
2010 REM DRAW GRAPH
2020 REM*********************************
2030 TRAP 2170
2040 RESTORE 4000
2050 COLUMN=1
2060 READ T1$,T2$
2070 DO UNTIL T2$="END"
2080 READ T3$
2090 X1=20+LH*COLUMN
2100 Y1=180-INT(VAL(T1$)/UNIT*LV)
2110 COLUMN=COLUMN+1
2120 X2=20+LH*COLUMN
2130 Y2=180-INT(VAL(T2$)/UNIT*LV)
2140 DRAW 1,X1,Y1 TO X2,Y2
2150 T1$=T2$ : T2$=T3$
2160 LOOP
2170 GETKEY A$
2180 GRAPHIC 0,1
2190 LIST 3000-
2200 END
```

This time, nothing will be printed on the screen. At the moment, however, we are not so much interested in the way IF works but in the way conditions are evaluated, so try the following

A=1(RETURN)
B=1(RETURN)
PRINT A=B(RETURN)

What you should see is −1, the value of a true condition. Now try

A=1(RETURN)
B=2(RETURN)
PRINT A=B(RETURN)

The result now will be 0, since the condition is not true. At first this may seem interesting but moderately irrelevant. In fact, this ability to extract a value from a logical condition is of great value in programming, as line 1140 illustrates.

What line 1140 does is to draw a series of lines at right angles to the vertical axis to mark the divisions specified by the user [illegible] pixels. However, whenever the value of the loop variable I is exactly divisible by five (ie every fifth mark) the condition (I/5 = INT(I/5)) will be true and will take on the value minus one rather than zero. In other words, including −4*(I/5 = INT(I/5)) in the line which specifies the length of the mark to be DRAWN, allows every fifth mark to be doubled in length without the use of a complex IF THEN ELSE statement.

Module 2.1.3: Lines 1000–1200

```
1000 REM********************************
1010 REM DRAW GRID
1020 REM********************************
1030 COLOR 0,1 : COLOR 1,8,4
1040 GRAPHIC 1,1
1050 LOCATE 20,20
1060 DRAW TO 20,180
1070 DRAW TO 300,180
1080 RESTORE 3000
1090 READ T$,T$ : CHAR,15,1,T$
1100 READ T$,T$ : CHAR,15,24,T$
1110 READ T$,T$ : FOR I=1 TO LEN(T$) : CHAR,0
,7+I,MID$(T$,I,1) : NEXT
1120 READ T$,NV : LV=INT(160/NV)
1130 FOR I=1 TO NV
1140 DRAW,20,180-I*LV TO 24-4*(I/5=INT(I/5)),
180-I*LV
1150 NEXT
1160 READ T$,NH : LH=INT(280/NH)
1170 FOR I=1 TO NH
1180 DRAW,20+I*LH,180 TO 20+I*LH,176+4*(I/5=
INT(I/5))
1190 NEXT
1200 READ T$,UNIT
```

Note that to *add* four to the length of the mark, we have to *take away* four times the value of the condition, since its value when true is *minus* one — taking away a minus number is equivalent to adding a positive one.

Lines 1160-1190: Exactly the same process is carried out for the horizontal axis. Note that here, the small marks are drawn upwards from the axis and so move from position 180 to position 176 down the screen. To increase the length of the mark, the 176 has to be reduced to 172, and this is done by *adding* four times the value of the true condition.

Line 1200: The number of units represented by each division on the vertical axis is read from the DATA statement.

Testing

To test this part of the program, all that is necessary is to RUN the program so far. You should see the graph grid drawn on the screen with TEST at the top, VERTICAL down the left-hand side and HORIZONTAL along the bottom. The two axes should be neatly divided up into 20 units each.

Hint: At the end of this test you will be left in high resolution mode. There is no [illegible] 0 or to try to type in GRAPHIC0 blind to get back to the text screen. Simply press *any letter key* (not a number), followed by RETURN. This will generate a syntax error which automatically returns you to low resolution. This simple technique will save you a great deal of time in the future.

Module 2.1.4 draws the graph itself, using the information specified in the DATA2 module (Module 2.1.2).

Commentary

Lines 2030 and 2170-2190: Pressing STOP at any time during the main drawing sequence, or pressing any key once the graph has been drawn, returns the C16 to low resolution and lists out the data on which the graph is based. This makes examining and changing the graph extremely easy.

Line 2050: COLUMN will be used to record the position of an item of data along the horizontal axis.

Line 2060: Two items of DATA are picked up. The reason that two are READ before the main loop is that the graph can only be begun if there is a place to draw *from* and a place to draw *to*.

Line 2070: On each pass through the loop, a new line will only be drawn if there is a valid co-ordinate for it to be drawn to rather than the END indicator.

Lines 2110-2130: These lines define the two points between which two points on the graph will be drawn. The X, or horizontal, co-ordinates are calculated by multiplying COLUMN (the number of units the graph has progressed along the horizontal axis) by the length in pixels of the horizontal units (LH). The constant 20 is the distance that the start of the horizontal axis is inset from [illegible]

Attention all Commodore 64
owners with a
1541 disk drive

MPS TOOLKIT

ONLY £13 95

- ★ **Single Drive 3-Pass Disk Backup** — or individual tracks
- ★ **File Copy** — transfer any number of files at once, up to 232 blocks long
- ★ **Disk Error Locator** — also checks for proper header, DOS ID s & catalog, with printer option
- ★ **Disk Error Maker** — makes 20 21 22 & 23 errors necessary for proper backup of protected disks
- ★ **Disk Drive Monitor** — address the drive's internal ROM & RAM
- ★ **Disk Doctor** — dozens of uses, read and change sectors recover lost data
- ★ **DOS Changer** — Protect your own disks
- ★ **Disk Log** — displays all files on a disk including start & end address beginning track and sector with printer option
- ★ **Loading Address Relocator** ★ **Disk Test**
- ★ **File Recovery** ★ **Compactor**
- ★ **Plus many more useful features!**

Beware of imitations! MPS TOOLKIT is the only disk utility for sale in the UK which includes all this at such a low price Comes complete with instructions is easy to use

ONLY £13 95 including P&P
Foreign orders please add £1 00
Send cheque or P O to:
MPS SOFTWARE
36 ALEXANDRA GROVE LONDON N4 2LF
Telephone 01-800 3592

The Adventure for Children

My First
Adventure
jolly
rogers
64

Help Humpty Dumpty and many other Nursery Rhyme characters as you explore the countryside This new adventure game by Jolly Rogers, has been written for the CBM 64 especially for children aged 6 to 12, with amusing sounds, illustrations for many locations and guaranteed correct spelling

Ask at your local stockist of CBM 64 software or order on the form below

Please send me ☐ cassettes at £5 95
☐ diskettes at £9 95
I enclose cheque/P O payable to

Jolly Rogers
19 Castleton Ave , Bexleyheath, Kent DA7 6QT
Tel. (0322) 332889

Name

Address .

LOOKING FOR NEW
PRODUCTS ?
PARALLEL PRINTER INTERFACE
39.95
12.95
HOUSE CONTROL
20.95
20.95
10.45
House Control
VIC-20
CBM-64
VIC-20 · CBM-64
zero
ELECTRONICS

PARALLEL PRINTER INTERFACE
Fot every standard printer Epson Brother Centronics, Star Oki etc.
- Compatible with existing software
- Does not use expansion/userport
- Complete, protectable, reset well documented 39.95
- Options: Built in 16kB High speed buffer 12.95

HOUSE CONTROL
Show your family Your computer can do more
- RELAY BOX switches everything on/off 20.95
- POWERBOX switches mains on/off 20.95
- INFRA RED SYSTEM invisible beam distance 7.5 ft
- SERVO SYSTEM move the muscles of your computer 10.45

Discover those unlimited possibilities

VIC-20
- 16 kB RAMPACK incl 2 slot motherboard 39.95
- 32 kB RAMPACK switchable cased 39.95
- 64 kB RAMPACK switchable cased and 2 kB eprom socket incl highspeed ramfile software 63.90
- 40/80 COLUMNCARD makes your VIC-20 a professional computer 61.50

CBM-64
- 80 COLUMN/GRAFIC-CARD 77.50 including textprocessor unlimited possibilities with simons basic further on: a lot of sophisticated features
- COM-IN 64 109.— changes the CBM-64 into a communication terminal for Baudot Morse, ASCII SSTV

VIC-20 · CBM-64
- MOTHERBOARD 2 slots 8.90
- MOTHERBOARD 5 slots buffered switchable 26.50
- EPROM CARD 8.90 2 type selectable sockets and changeable adresses
- EPROM PROGRAMMER make your own programs powerful combination with ep 42.45
- EPROM ERASER for 4 eproms 30.45
- MONITOR ZENITH 24.95

ZERO ELECTRONICS

SERIOUS 64 SOFTWARE

Dr Watson Basic Course (Honeyfold)t	10 50
Dr Watson Assembly Course (Honeyfold)t	12 50
Assembler Development Pack (Commodore)d	28 95
Mastercode Assembler (Sunshine)t	14 95
MON64 (Handic)r	37 95
Programmers Utilities (Commodore)d	14 99
Programmers Ref Guide (Commodore) Book	9 95
LOGO (Commodore)d	34 95
CPM (Commodore)r + d	49 95
Simons Basic (Commodore)r	44 95
Petspeed64 Basic Compiler (Commodore)d	44 95
DFM Database & Labels (Dialog)t/d	30 00
Transact Book keeping (Dialog)t/d	30 00
Invostat Invoice & Statements (Dialog)t/d	30 00
Cashbook & VAT Accounts (Gemini)t/d	59 95/64 95
Final Accounts (Gemini)t/d	59 95/64 95
Calc Result Easy (Handic)r	49 95
Calc Result Advanced (Handic)r + d	95 00
Superbase64 (precision)d	99 95
Easyscript (Commodore)d	69 99
Easyspell (Commodore)d	47 95
Micro Magpie (Audiogenic)d	39 95
Micro Wordcraft (Audiogenic)d	24 95

t = Tape d = Disk r = Cartridge

Send large SAE for a list of our full range

PLUS — THE PRICE YOU SEE IS ALL YOU PAY

- FREEPOST (no stamp needed) for ordering
- FREE postage, packaging and insurance
- 14 Day MONEY BACK guarantee

ACT NOW by sending cheque or postal order to

64 PLUS

FREEPOST BLETCHLEY
MILTON KEYNES
MK3 7EF

◀The Y or vertical, co-ordinates are slightly more complex. Starting from the basis of the bottom end of the axis, which is 180 pixels down the screen, the value of the DATA item is first divided by UNIT Thus if the DATA item were 1,000 000 and the user had specified that the vertical axis was to be divided into units of 100,000, (UNIT = 100,000), then the result would be 1,000,000/100,000 or 10 units Having arrived at the number of units, this is then multiplied by the length in pixels of the vertical units (LV) The figure arrived at is subtracted from 180 since the screen is numbered from zero at the top

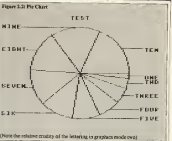
Line 2150 Each time a single line is drawn on the graph, its end point becomes the start point for the next line If T3$ contains END, however, the following line will terminate the execution of the loop

Testing

RUN the finished program and you should see a smooth, bell shaped curve drawn When drawing is finished, press any key and you should see the DATA modules listed onto the screen so that you can alter them at will

One very useful way of presenting small amounts of data is the pie chart technique, where a circle is broken up into segments representing the proportion of a total handed over to the different parts which make it up In the program which follows we shall draw on what we have already learned about the mathematics of circles and the flexible use of DATA statements in the last program

Figure 2.2: Pie Chart



(Note the relative crudity of the lettering in graphics mode two)

As with the previous high resolution graph, the figures on which the present graph will be based are contained in DATA statements this time in module 2.2 1 Note, however, that in the program as listed, the two arrays which will be used to hold the name of each item and its value are not dimensioned, so you are limited to 10 items

Frankly, a pie chart with more than 10 items is of little value, because it becomes too crowded to really take in the information Even so, you can if you wish include a dimensioning statement at the beginning of the program If you do include such a statement and increase the number of items, you may find that you have to drop some of the module headings, since the program runs right up against the limits of memory

Module 2 2 2 processes the data for the chart The information contained in the DATA module is read into the variables NAME$ and ITEMS, and the arrays NAME$ and A

Commentary

Lines 5080-5100 The value of the items to be charted are first added together to discover the total that the circle will represent The DATA pointer is then RESTOREd to the beginning of the quantity figures and each quantity is translated into a second figure which, when divided into 360, would give the same result as the original quantity divided into the total For instance, if the total were 100, and the quantity for one item were 25, this would be translated into 90 or 25% of 360 These new figures will later be used to determine how large a chunk of the pie chart will be given to each item

Testing

Enter the following lines from what will eventually be the control module and then RUN the program

```
1040 GOSUB 5000
1110 END
```

If all is well, then nothing should happen visibly — only if there is an error of some kind will you see anything If you wish however, you can print out the contents of the variables and arrays named in ▶

Module 2.2.1: Lines 4000 – 4080

```
4000 REM*******************************
4010 REM DATA FOR CHART
4020 REM*******************************
4030 DATA TITLE,TEST
4040 DATA NUMBER OF ITEMS,10
4050 DATA NAMES.ONE,TWO,THREE,FOUR,FIVE,SIX,S
EVEN,EIGHT,NINE,TEN
4060 DATA
4070 DATA QUANTITIES,1,2,3,4,5,6,7,8,9,10
4080 DATA
```

Module 2.2.2: Lines 5000 – 5110

```
5000 REM*******************************
5010 REM PROCESS DATA
5020 REM*******************************
5030 RESTORE 4000
5040 READ T$,NAME$
5050 READ T$,ITEMS
5060 READ T$ : FOR I=0 TO ITEMS-1 : READ NAME
$(I) : NEXT
5070 RESTORE 4070
5080 SUM=0 : READ T$ : FOR I=0 TO ITEMS-1 :
READ T : SUM=SUM+T : NEXT
5090 RESTORE 4070
5100 READ T$ : FOR I=0 TO ITEMS-2 : READ T :
A(I+1)=(T/SUM)*360+A(I) : NEXT I
5110 RETURN
```

VIC 20 WORD PROCESSOR — VICTEXT

Powerful word processor Facilities include Large text buffer auto centre text, variable tab insert amend delete copy move text word count, right justify etc Fully menu driven with comprehensive easy to use instructions Great value
VIC 20 + 16K cassette £8 50
VIC 20 + 16K disk £8 45

VIC 20 FILE — DATA FILE

Takes the place of any card index Facilities include save load file, full sort print all sort records amend delete records memory remaining etc
VIC 20 (+8K min) cassette £4 50

All programs with full documentation and guarantee and can be used with all direct connect VIC printers including 1520 printer plotter and most Centronics (with suitable hardware interface) if required Price includes VAT packing and fast delivery by 1st class mail
Cheques PO's to

A & C SOFTWARE
51 Ashtree Road, Tividale,
West Midlands B69 2HD

Multi Function C 64/SX 64 Printer Interface

Name
PRINT-64

Manufacturer
Jansen Electronics
Unter Oelbach 1
D-5090 Leverkusen 3
W. Germany
(0) 2171/30676

Price
Interface and Diskette
US $ 119 £ 83 95

Dimensions
8 × 15 × 2 cm W × D × H (case)

Printers
Epson FX 80 Star Gemini 10 X
in innumerable variety

Memory
8K buffer, optional at time of order (additional US $ 35 — £ 29 95) holds HIRES Picture or several pages of text (in preparation)

Interfaces
C 64 serial port
8 bit parallel (Centronics)

Power requirements
Vcc (+5V) through pin no 18 of printer connector

Features
Through secondary address

- Lower/upper case, graphic symbols, normal and inverted
- Commodore graphics characters, normal and inverted
- Program listing shows control characters without conversion
- Transparent mode feeds ASCII right through for printer control
- Mixed modes: any of the above modes except listing can be operated simultaneously to allow variation of modes from character to character
- Text hardcopy shows exact copy of screen (two sizes)
- HIRES hardcopy dumps screen picture in four possible sizes each positive or negative in about 70 seconds
- Multicolor graphics is printed in different grey shades assigned to each color by default or through menu
- Hardcopy prints in rows of 76 hex bytes
- Diskette contains interactive relocatable terminal software, a printer course with sample routines and programs for loading and printing graphics, screen dumps, etc
- Brief summary is readily readable on top cover of housing

Audience
All C 64 and SX 64 users with the following applications: word processing, HIRES graphics, multicolor graphics, screen dumps of text and HIRES graphics, true copies of program listings containing Commodore graphic symbols, normal and inverted

Terms
Certified bank checks, Access or Master card State card number and expiring date with your signed order. In Europe: Add 3% for shipping and handling.

ASTROLOGY for beginners

A Starter Pack comprising a simple program to calculate a horoscope, an introductory booklet and two self teaching programs (how to interpret the horoscope)

only £11 50

No previous knowledge required

Available for Commodore 64 & Commodore PET 3000/4000/4000

Also many other programs for more experienced astrologers

Please send me the Astrology Starter Pack for use on

I enclose a cheque/PO UK for £11 50 (inc p&p) Outside UK add 60p, or I enclose a large sae for free catalogue

Name

Address

ASTROCALC (Dept CH) 67 Peascroft Road
Hemel Hempstead, Herts HP3 8ER tel 0442 51809

THE EASY WAY TO KEEP YOUR RECIPES.

Searching through hundreds of recipes taken from magazines for exactly the kind you want to see can be almost impossible, but its easy with your Commodore 64

RECIPE SEARCH (£10*) is ready to use

You build up your record as you get new recipes and typing is kept to a minimum

TWILIGHT SOFTWARE PO BOX 64 LONDON E11 4SH

*Cassette Includes p and p £1 extra overseas Or send for details

NOVASOFT CBM 64 GRAPHIX EDITOR

Design your own sprites and characters quickly and easily in standard or multicolour modes

Display data on screen or save it to tape or disc

Construct character pictures using the display block

Full on screen editing

All for only £5 95 (cassette only)

NOVASOFT SOFTWARE RED COTTAGE,
SANDOWN ROAD SANDWICH KENT CT13 9NY

COMMODORE 64 DATABASE — DATAFILE

Powerful options include print all/selective records delete amend save load copy alphanumeric sort user defined fields memory check, total numeric fields multi field interrelational, global and between limits searches etc Fully menu driven with comprehensive easy to use instructions
CBM 64 (compiled) cassette £7 45
CBM 64 (compiled) disk £10 45

COMMODORE 64 WORDPRO — TEXTFILE

Powerful word processor facilities include — large text buffer auto centre variable tab insert amend delete copy move text word count right justify paging, join files multiple file handling print all/part text etc Fully menu driven with comprehensive easy to use instructions Great value
CBM 64 (compiled) cassette £8 25
CBM 64 (compiled) disk £10 75
All programs with full documentation and guarantee and can be used with all direct connect CBM64 printers including 1520 printer/plotter Also most centronics (with suitable hardware interface) Price includes fast delivery by first class post
Cheques/PO's to A & C SOFTWARE
51 Ashtree Road Tividale West Midlands B69 2HD

See what happens
when you play.

LEWDO!

It's fun . . . It's naughty . . . It's a game for up to six adults

FOR THE COMMODORE 64 — now £5 95

Twilight Software, PO Box 64 London, E11 4SH

LEWDO! is unsuitable for under — 18s

Joysticks not needed

ARE YOU OFFERING A COMMODORE PRODUCT OR SERVICE?

Offer it where it'll be seen — £40 buys this space for one month and puts your business in front of thousands of proven Commodore enthusiasts and trade contacts nationwide

Call the **COMMODORE HORIZONS** Ad Dept
on **01-437 4343**
You could be here next month

◀ the module just to reassure yourself.

Module 2.2.3 sets up the graphics mode and associated colours, and draws an 80*80 circle in the centre of the screen, together with the name for the chart

Commentary

Line 2030: The graphic mode we are going to use is multicolour mode, which will allow us to have three different colours (plus the background) on the screen at the same time. The advantage to this is that it makes the chart easier to read. But the more colours it is possible to have on the screen at any one time, the more complicated it is for the C16 to record the colour of each individual pixel, and the more memory is needed.

Since the graphics screen already eats up enough of the memory, when we go into multicolour mode the operating system does a trade-off between colour and detail. Once in mode three the smallest unit we shall be able to actually *do* anything with will be one pixel down by *two* pixels across. The screen, as far as the C16 is concerned, will no longer be 320 pixels across but 160, thus saving memory which can be devoted to remembering the greater range of colours

From now on, therefore, whenever you look at the X co-ordinate (across the screen) of anything in this program, remember that you need to double it before it is comparable with the same co-ordinates in previous high resolution programs in the book which use normal high resolution

Line 2040. The little expression in the CHAR statement simply ensures that no matter how long the title given to the chart, it should always look as if it has been printed roughly in the middle of the top line.

Module 2.2.3: Lines 2000–2070

```
2000 REM********************************
2010 REM DRAW FRAMEWORK
2020 REM********************************
2030 GRAPHIC 3,1
2040 COLOR 0,1 : COLOR 1,2 : COLOR 2,4,4 :
COLOR 3,6,4
2050 CHAR ,20-LEN(NAME$)/2,0,NAME$
2060 CIRCLE ,80,100,40,80
2070 RETURN
```

Line 2060: An illustration of the point made earlier about dimensions in multicolour mode. To make sense of the position and dimensions of this circle, multiply the first and third parameters by two.

Testing

Add the following lines and then RUN the program:

1060 GOSUB 2000
1080 GETKEY A$
1090 GRAPHIC 0

The result should be nothing more exciting than the title given to the chart and a white circle. Press any key except RUN/STOP to get back to the normal screen

Module 2.2.4 draws in the segments into which the chart will be divided, colours them and attaches the labels specified in the DATA module. In order to understand what is going on, you will need to be able to remember the simple mathematics of a circle

Module 2.2.4: Lines 3000–3200

```
3000 REM***********************************
3010 REM INSERT SEGMENTS
3020 REM***********************************
3030 FOR I=0 TO ITEMS-1
3040 R=A(I)/180*π
3050 DRAW ,80,100 TO 80+40*COS(R),100+80*SIN(
R)
3060 NEXT I
3070 FOR I=0 TO ITEMS-1
3080 R=(A(I)+4)/180*π
3090 CC=I-3*INT(I/3)+1  : IF I=ITEMS-1 THEN C
C=0
3100 PAINT CC,80+32*COS(R),100+72*SIN(R),1
3110 TA=(A(I)+A(I+1+ITEMS*(I=ITEMS)))/2
3120 IF A(I+1)<A(I) THEN TA=TA+180
3130 R=TA/180*π
3140 TX=80+40*COS(R)
3150 TY=100+80*SIN(R)
3160 DX=ABS(159*(TX>80))
3170 DRAW ,TX,TY TO DX,TY
3180 CHAR 1,DX/4+(LEN(NA$(I))-1)*(DX=159),TY/
8,NA$(I)
3190 NEXT I
3200 RETURN
```

Commentary

Lines 3030-3060. A series of lines are drawn from the centre of the circle to the circumference, dividing the circle up into the segments for the chart. The figures used are those calculated in Module 2.2.2.

Lines 3080-3100: The angles at which the segments start are calculated again, but four degrees are added to each to clear the lines drawn by the previous loop. A position is then calculated on the basis of this angle which is just inside the circumference of the circle. The PAINT command is then used to colour the wedge shaped segment in which the current point falls

Line 3090 produces a cycle of the three foreground colours specified in Module 2.2.3, except for the last segment, which is left as background colour. This is because it ensures that the final segment cannot be the same colour as the first. Since they are next to each other this would make the chart harder to read

Lines 3110-3120: These two lines calculate an angle half way between the start and finish point of the current segment. It is possible that in moving from the start point to the finish point we will cross the 360-0 boundary on the circle, producing a nonsense figure — adding 180 rectifies this

Lines 3130-3150: The figures needed for defining a point in relation to the radius. The reason that the SIN and COS values are stored in the variables TX and TY on this occasion is that they are going to be used more than once in a line and there would not be room to spell them out in full

Line 3160: You will recognise the use of a logical condition here. Its effect is to make DX either zero or 159 according to whether the point defined by TX and TY is to the left or the right of the centre of the circle

Lines 3170-3180: A line is drawn from the circumference of the circle to the edge of the screen on the left or the right as defined by DX. At the end of the line, or rather over it, is printed the label for the segment to which the line points. The print position for labels on the right hand side is moved to the left so that they do not run off the end of the screen, again using a logical condition.

Testing

Add the following line and RUN the program

1070 GOSUB 3000

You should see a display like the one at the beginning of the section for this program, except that it will be in colour rather than plain black and white

Module 2.2.5 is the control module ▶

◀ Most of the lines for this have already been entered, but make sure that you have all the lines listed in the module or you will miss one or two refinements

Commentary

Lines 1030 and 1120-1130 A brief error message to indicate that there is probably an error in the layout of the DATA module — that is not infallible as a test, since some mistakes will not generate errors detectable by TRAP

Testing

Change one of the figures under the QUANTITIES heading to a letter, then RUN the program You should see the program error message and then the DATA module listed out Correct the deliberate mistake and RUN the program again This time pressing RUN/STOP (or any key once the chart is drawn) should list out the DATA module.

Having looked at two different means of presenting data in high resolution mode, it is wise to remind ourselves of the immense flexibility which Commodore's excellent low resolution graphics set provides Using the low resolution graphics characters not only provides the user with ready made effects which it would be extremely difficult to provide in high resolution, it allows the full range of colours to be employed and, not least, frees the memory which would otherwise be tied up in the high resolution screen

In the final program we shall create a three dimensional bar chart whose display is, I think, one of the best demonstrations of just how impressive the C16's low resolution can be — in fact the kind of display that will have you calling in the family to show them just how clever you really are

Module 2 3 1 looks after the Initialisation It is a straightforward module to declare a small number of variables and arrays

Module 2.2.5: Lines 1000–1130

```
1000 REM******************************
1010 REM CONTROL
1020 REM******************************
1030 TRAP 1120
1040 GOSUB 5000
1050 TRAP 1090
1060 GOSUB 2000
1070 GOSUB 3000
1080 GETKEY A$
1090 GRAPHIC 0
1100 SCNCLR : LIST 4000-4999
1110 END
1120 FRINT "PROBABLE▽INVALID▽DATA▽FORMAT"
1130 FOR I=1 TO 3000 : NEXT : RESUME 1100
```

Commentary

Line 2050 The array HH will be used to store the data for the graph Since the figures in the DIM statement must be counted from zero, what is provided here is space for three sets of seven data items

Line 2060 The string R$ will be used in the data file module and explanation can wait until that module

Line 2070 This string is made up of three colour control codes, ie characters which, if printed, change the print colour The three colours in order, represent yellow, green and purple Later on, the string will be used to provide flexible changes from one colour to another

Line 2080 This INPUT is designed to allow a later module to call up a set of data for a graph from disk (or tape)

Module 2 3 2 (which will be printed next month) accepts the data Since we are working in low resolution, there is no need for us to adopt the ruse of using DATA statements to store changing information Most programs which work on useful information will make provision for the user to input such information while the program is running — such programs are known as interactive In the case of the present program, all the information can be gathered at one time, so what we see is a module which requests information, uses that information to ask for more and performs checks for mistakes in entry

Commentary

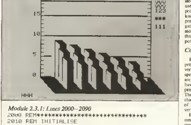
Lines 3050-3060 As with the line graph program, earlier, each single unit on the vertical axis can represent any value specified by the user Note that because we are working in low resolution we do not have the same flexibility as the previous program in the size of the vertical units The only practical size for each unit is one character square's height, and the format of the graph will allow 19 units on the vertical axis

Lines 3070-3080 The graph will allow, as mentioned previously, three sets of six items to be presented They will be displayed in the form of three lines of up to six solid bars Each line of bars will be called a bank, and the individual bars will be called columns.■

The final part of this article will be published next month

This article is based upon an extract from *The Working C16* by David Lawrence It is published by Sunshine Books and costs £6.95.

Figure 2.3: 3D Graph

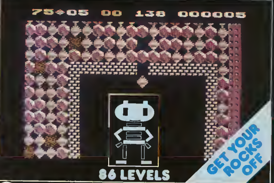


Module 2.3.1: Lines 2000–2090

```
2000 REM******************************
2010 REM INITIALISE
2020 REM******************************
2030 COLOR 0,11 : COLOR 4,10 : SCNCLR
2040 CHAR,16,1,"[RVS ON][RED]GRAPH" : PRINT
2050 DIM HH(2,6)
2060 R$=CHR$(13)
2070 CO$="[YEL][GRN][PUR]"
2080 INPUT "[BLK][CD]LOAD▽FROM▽DISK▽(Y/N):";Q
$
2090 RETURN
```

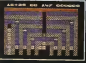
BIGGER, BOULDER, More BEAUTIFUL

AMERICAN NO 1.

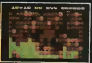

75◆05 00 138 000005
86 LEVELS
GET YOUR ROCKS OFF

BOULDER DASH

commodore 64



BOULDER DASH



CASSETTE 8·95 **DISK 10·95**

State Soft Ltd,
Business & Technology Centre,
Bessemer Drive Stevenage,
Hertfordshire SG1 2DY
Phone (0438) 316561

Statesoft

Really Something Else

Now your Commodore 64 is a robot or a synth . It's processing words , painting pictures & doing maths in machine code . It's teaching you , taking you on an adventure & using its brains ...All because you've read a book.

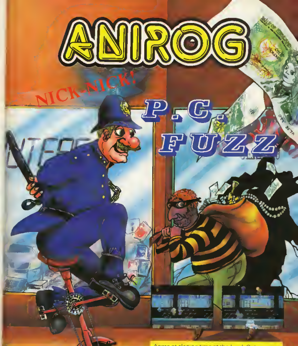
Sunshine books make your Commodore mean more.

Start building your library today:

Use this order form to buy the best books available for your Commodore 64
Please send me the books indicated on this form.
☐ I enclose a cheque/postal order for £.............. payable to Sunshine Books.
☐ Please charge my Access Card No
Signed
Name
Address

☐ Please send me your Sunshine Microcomputer Books catalogue
Send this order form with your cheque or postal order to: Sunshine Books
12/13 Little Newport Street London WC2R 3LD
Phone orders call 01-437 4343 and charge to your Access/Barclaycard.
Computer dealers. Ring our dealer enquiry line on 01 437 4343

- ☐ **The Working Commodore 64 £5.95** A library of practical subroutines.
- ☐ **Commodore 64 Machine Code Master £6.95** A library of machine code routines.
- ☐ **Graphic Art for the Commodore 64 £5.95** Techniques for high resolution graphics.
- ☐ **Commodore 64 Adventures £5.95** A guide to writing and playing adventures.
- ☐ **Mathematics on the Commodore 64 £5.95** Essential routines for programming.
- ☐ **Business Applications for the Commodore 64 £5.95** Write your own business programs.
- ☐ **Advanced Programming Techniques on the Commodore 64 £5.95** Powerful ideas and applications.
- ☐ **Programming for Education on the Commodore 64 £5.95** A handbook for primary education.
- ☐ **Artificial Intelligence for the Commodore 64 £6.95** Make your micro think.
- ☐ **DIY Robotics and Sensors for the Commodore 64 £6.95** Practical projects for control applications.
- ☐ **Machine Code Graphics & Sound for the Commodore 64 £6.95** Easy to load routines and ideas.
- ☐ **Machine Code Games Routines for the Commodore 64 £6.95** A guide to creating top quality games. *Published June 1984*
- ☐ **Building with Logo on the Commodore 64** Creative use of the language *Published May 1984*
- ☐ **Commodore 64 Disk Companion £7.95** Essential routines for the Commodore disk users. *Published May 1984*



Aggro at closing time at the local Getaway car screeches to a halt outside a bank Ingenious methods employed by the Mafia to literally spirit away the loot from the High Street Never fear P C Fuzz is on patrol

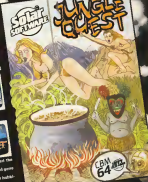
COMMODORE 64 **£7 95**

Also available on Disk at £9.95

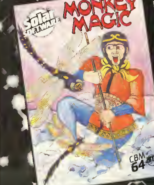
TRADE ENQUIRIES **ANIROG SOFTWARE LTD. 29 WEST HILL DARTFORD KENT (0322) 92513/8**
MAIL ORDER 8 HIGH STREET HORLEY SURREY 24 HOUR CREDIT CARD SALES HORLEY (02934) 6083
PAYMENT BY CHEQUE P O ACCESS/VISA 50p POSTAGE & PACKAGING

Solar SOFTWARE

ACTUAL SCREEN SHOTS TAKEN FROM CBM 64



Young Jim he was a fearless lad he roamed the jungle free
He went in search of Jane one day but she'd gone out for tea.
The natives were preparing her with water bubbling hot
If you don't rescue Jane in time she'll end up in the pot.
£7.95



ACTUAL SCREEN SHOTS TAKEN FROM CBM 64

Born in an egg on a mountain top
Ask for MONKEY MAGIC at your local shop
He knew all the magic tricks under the sun
To play this game, guide monkey round
and have some fun
£7.95

100% Machine Code, JIFFY fast load, Joystick and keyboard, Multi-screen, Hi-res scrolling Graphics, Available now at your local computer shop Mail order price includes vat and p&p Trade enquiries to Brenda Shay

Other titles available			
GALAXIONS	£7.95	MUNCH MAN 64	£7.95
ROBIN TO THE RESCUE	£7.95	ALLEY CAT	£7.95
BOGY MEN	5.95	BIZZY BEEZzzz	5.95

SOLAR SOFTWARE LTD
77 WEST DRIVE, BURY LANCS BL9 5DW
ENGLAND TEL 061 761 1770

COMMODORE SOFTWARE FILE

Laser Zap

Samir Devani from Bromley sends this program for the 64

THE AIM of Lazer Zap is to destroy the enemy ships and capture flying letters. Let the letters move into your clutches, and avoid the Zapper, which will shoot your ship if you fall in line with it. Bomb the enemy ship or it will fire homing missiles, and look out for the ships of your comrades plunging from the sky. More instructions are included in the program. Use a joystick in Port One. Collect all the letters and they spell a message, and the game comes to an end.

```
1 REM**************
2 REM* LASEP ZAP *
3 REM*B' S.DE'ANI*
4 REM*LUB HOUSE *
5 REM*************
6 REM
7 REM PEDIFINE CHAPACTERS
8 GOSUB1305 DIMS(70) POKE650,128
10 PRINTCNR$(142) POKE52,48 POKE56,48 CLR POKE56334,PEEK(56334)AND254
15 POKE1,PEEK(1)AND251 FORI=0TO511 POKEI+12288,PEEK(I+53248) NEXTI
20 POKE1,PEEK(1,OR4 POKE56334,PEEK(56334)OR1 POKE53272,(PEEK(53272)AND240)+12
25 FORA=12288TO12288+7 READAA POKEA,AA NEXTA J=1
30 DATA 255,128,248,252,248,128,255,0
35 FORB=12792TO12792+7 READBB POKEB,BB NEXTB
40 DATA 0,0,3,3,255 127,63,31
45 FORC=12552TO12552+7 READCC POKEC,CC NEXTC
50 DATA 0,0,192,192,255,254,252,248
51 FORUY=12448+23TO12448+30 READEW POKEUY,EW NEXTUY
52 DATA 0,60,60,60,60,24,24,0
55 FORD=12784TO12784+7 READDD POKED,DD NEXTD POKE53281,0
60 DATA 0,0,60,60,60,60,126,255
61 FOR1=12448TO12455 READ L POKEI,L NEXT
62 DATA 24,24,24,60,60,60,24,0
65 REM INTIALIZE VARIABLES
70 AB=1424 AC=55696 Z=1984 ZZ=56256 I=1985 II=56257 O=1942 OO=56214 PRINT"J"
71 OP=1423 PQ=55695 EW=1024 TY=55296
72 FOROQ=1TO40 POKE1943+OQ,105 POKE 56215+OQ,6 NEXTOQ
75 POKEI,62 POKEII,1
80 POKEAB,0 POKEAC,1
81 PRINT"▒▮▮SCORE="SC PRINT"▒▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮HI-SCORE"HI
82 IF F=1THEN200
83 IFU=1THEN230
85 IFKL=1THEN265
95 T=INT(10*RND(1)) IFT>8TNEN295
100 TT=1NT(10*RND(1)) IFTT>7TNEN205
105 TR=INT(10*RND(1)) IFTR>7THEN246
110 RT=INT(10*RND(1)) IFRT>6THEN335
128 PE=PEEK(56321)
125 IFPE=254THENPOKEAB,32 POKEAC,1 AB=AB-40 AC=AC-40
130 1FPE=246TNENPOKEAB,32 POKEAC,1 AB=AB-39 AC=AC-39
135 IFPE=247THENPOKEAB,32 POKEAC,1 AB=AB+1 AC=AC+1
140 IFPE=245THENPOKEAB,32 POKEAC,1 AB=AB+41 AC=AC+41
145 IFPE=253THENPOKEAB,32 POKEAC,1 AB=AB+40 AC=AC+40
150 IFPE=249TNENPOKEAB,32 POKEAC,1 AB=AB+39 AC=AC+39
155 IFPE=251THENPOKEAB,32 POKEAC,1 AB=AB-1 AC=AC-1
160 IFPE=250TNENPOKEAB,32 POKEAC,1 AB=AB-41 AC=AC-41
165 IF PE=239TNEN185
175 POKEI,32 POKEII,1 I=I+1 II=II+1 IF I=2823THENI=1984 II=56256
180 GOTO 75
185 POKEW,32 POKEWW,1 W=0 WW=0 W=AB+40 WW=AC+40
```

▶

```
◀
187 POKE W,20 POKEWW,1
100 IF W+40=PTNENHH=40 LB=39 GOTO1000
191 IF W+41=OTHENHN=41 LB=42 GOTO1000
193 IF W+40=OTNEHHH=40 LB=41 GOTO1000
194 IF W>1943TNENPOKEW,32 POKEWW,1 F=0 GOTO75
195 F=1 OOTO83
200 W=W+40 WW=WW+40
201 IF W>1943TNENPOKEW-40,32 POKEWW-40,1 W=0 WW=0 F=0 GOTO75
202 POKEW-40,32 POKEWW-40,1 GOTO187
205 REM MOVE SNIP
210 IF N=0THEN215
211 GOTO75
215 P=1943 PP=56215 N=1
220 POKEO,63 POKEOO,1 POKEP,33 POKEPP,1 LA=40+P MY=LA-920
221 IF LA-AB=40THEN315
222 IF LA=MYTNEN225
223 LA=LA-40 GOTO221
225 U=1 GOTO85
230 POKEO,32 POKEOO,1 POKEP,32 POKEPP,1
235 O=O-1 OO=OO-1 P=P-1 PP=PP-1
240 IF O=1903THEHO=1942 OO=56214 H=0 U=0 TT=0 GOTO75
245 OOTO220
246 REM MESSAGE
250 READ X KI=1
254 IF X=999THENPOKEEW,32 POKETY,1 EW=EW+1 TY=TY+1 GOTO250
255 IFX=9999THENTU=55296 FORV=1024TO1024+40 POKEV,32 POKETU 1 TU=TU+1
    NEXTV GOTO 290
256 IF OP-AB=1THEHPOKEOP 32 POKEPO,1 OP=1423 PO=55695 KL=0 J=J+1 SC=SC+10
    GOTO268
257 POKEOP,X POKEPO,1 LA=40
260 KL=1 GOTO120
265 POKEOP,32 POKEPO,1 OP=OP-1 PO=PO-1 YU=1
266 IF OP=1363THENOP=1423 PO=55695 kL=0 J=J+1 KI=0 GOTO75
267 GOTO 254
268 POKEEW,X POKETY,1 EW=EW+1 TY=TY+1 kI=0 GOTO75
280 DATA 12,1,19,5,18,999,26,1,16,999,2,25,999,19,999,4,5,22,1,14,9,999,3,12
285 DATA 21,2,999,8,15,21,19,5,999,19,15,6,46,9999
290 EW=1024 TY=55296 RESTORE SC=SC+1000 GOTO2000
292 IF W+42=PTHEHEND
295 IL=I-80 LI=I-920 REM  LASEP ZAP
300 JK=II-80 FORV=ILTOLI STEP-40 POKEV,23 POKEJK,1 IF V-AB=40THEH1300
305 FOPG=1TO10 POKEV,32 POKEJK,1 JK=JK-40 NEXTV
310 JK=0 GOTO75
315 KF=P-40 Fk=PP-40 REM  FIRE FROM SHIP
320 POKEKF,23 POKEFK,1
325 IF KF-AB=40TNEN1100
330 KF=KF-40 FK=Fk-40 GOTO320
335 REM FELLOW MATES FALLING DOWN
340 ZH=1105 NZ=55377 MZ=1122 ZM=55394 LZ=1142 ZL=55414 PUT=ZN+800
345 POKEZH,0 POKEHZ,1 POKEMZ,0 POKE ZM,1 POKE LZ,0 POKEZL,1
350 IF ZN+40=ABTHEN1300
355 IF MZ+40=ABTNEN1300
360 IF LZ+40=ABTHEH1300
365 POKE ZH,32 POKE HZ,1 POKEMZ,32 POKEZM,1 POKELZ,32 POKEZL,1
370 IF ZN=PUTTNENZH=0 HZ=0 MZ=0 ZM=0 LZ=0 ZL=0 GOTO75
375 ZN=ZH+40 NZ=NZ+40 MZ=MZ+40 ZM=ZM+40 LZ=LZ+40 ZL=ZL+40 GOTO345
1000 POKE W,32 POKEWW,1
1005 POKE W+LB,102 POKEWW+LB,1
1010 FORXX=1TO50 HEXTXX
1015 POKEW+NH,32 POKEWW+HH,1 POKEW+LB,32 POKEWW+LB,1 U=0 SC=SC+100 H=0 F=0
1020 P=0 O=1942 OO=56214 GOTO75
1100 POKE KF-40,201 POKE FK-40,1 FORTH=1TO100 HEXTTH
1200 PRINT"▯QQQQQ▮▮▮▮▮▮▮▮▮▮▮▮▮YOUR MISSION IS OVER" PRINT"QQQ▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮PLAY
     AGAIN(Y/N)"
1210 GET HR$ IF HR$="Y"TNENPRINT"▯" U=0 KL=0 F=0 GOTO1225
```

```
1215 IF HR$="H"THENEND
1220 OOTO1210
1225 IF(SC-HI)>1THENNI=SC
1230 SC=0 GOTO65
1300 POKE AB,201 POKEAC,1 FORTH=1TO200 NEXTTN GOTO1200
1305 PRINT"■■■■■■■■■■■■■■LASER ZAP"
1310 PRINT"■■YOU ARE ONE OF THE SURVIVORS FROM"
1315 PRINT"WORLD WAR 3.YOU ARE RECALED TO BATTLE"
1320 PRINT"AGAIHST THE EVIL FORCES LEAD BY TRI-X"
1325 PRINT"YOU HAVE BEEN TOLD TO WATCN OUT FOR THE"
1330 PRINT"ZAPPER AND TO DESTROY TNE ENEMY SNIP"
1335 PRINT"YOU HAVE A FLEET OF ARMY ABOVE YOU WNO"
1340 PRINT"IF SNOT DOWN MIGHT COLIDE INTO YOU' AND ALSO CAPTURE TNE LETTERS  "
1345 PRINT"■■■■■■■■■■■■■■GOOD LUCK!!!!"
1350 PRINT"■■■JOYSTICK IN PORT 1 OR USE TNE KEYS"
1555 PRINT "■■■■■■■■■■■CTRL■=BACKWARDS    ■■=DOWN    "
1560 PRIHT "■■■1■=UP  ■■■2■=FORWARDS    ■SPACE■ TO FIRE  "
1565 PRIHT"■■■■■■■■■■■■■PRESS 'S' TO START■'
1570 GET RE$ IF RE$="S"TNENPRINT"■■■■■■■■■■■■■■■■■■■■■■WAIT■" RETURN
1575 GOTO1570
2000 PRINT"■■■■■■■■■YOU HAVE SURVIVED YOUR MISSION ELL DONE!"
2005 PRINT"■BUT NOW YOU MUST CARRY ON YOUR BATTLE"
2010 FORXXX=1TO500 NEXTXXX GOTO70
```

Doubler

Andrew Tilley from Trowbridge sends this Vic 20 program

ANDREW'S program gives double sized characters on every letter and symbol on the Vic 20 keyboard

Once RUN, the program takes 30 seconds to set up the magnified character set, since there are 3000 numbers to be poked in. You can then NEW the program and use the new character set

POKE 36865,20 can be used to centralise the screen, otherwise you may not be able to see the cursor position. Simple but extremely effective

```
10 A=5120 Z=5120
19 B=PEEK(A+27648)
20 POKEZ,B
30 Z=Z+1
40 POKEZ,B
50 A=A+1 Z=Z+1 IFZ>7678THEN7u
60 GOTO19
70 POKE36969,253 POKE36867 PEEK(36867)OR1
```

Space Mines

Kevin Hughes sends this program for the unexpanded Vic 20

SPACE MINES is a version of Lunar Lander. You must guide your spaceship through the mines to a safe landing, using the joystick. After three safe landings you get a bonus take-off, where you score points by ramming the mines and docking with your mother ship.

You can use the <and> keys to control the ship if you prefer. Press A or the fire button to abort, and beware of extra dangers such as the black mine. Tread very carefully

```
10 PRIHT"■  POKE36879,221
15 PRIHT PRINT
20 PRINT" /‾ /‾\ /‾\ /‾‾ ‾‾"
25 PRINT" \  | | |_| |   \_"
30 PRIHT"  \ |‾  | | |   /‾"
35 PRIHT" _| |   | |\_/ \__"
40 PRINT"■■■■"
45 PRINT"      /\/\INES"
50 PFINT"■■■    BY KE'IN HUGHES"
```

▶

```
◀60 PRINT"▒▒ HIT A KEY WHEN READY"
70 FORI=125TO30STEP-1 N=N+I POKE36865,I POKE36878,15 POKE36876,128+N FORJ=1TO40
NEXTJ,I
75 POKE36876,0
80 GETA$ IFA$=""THEN80
100 POKE36879,8
110 FOPT=0TO1000 READA IFA=-1THEN195
119 POKE7168+T,A NEXTT
150 DATA 16,24,20,18,255,80,48,16,0,0,44,127,255,255,255,255
160 DATA 0,0,0,0,0,32,0,0,24,36,126,255,129,189,0,153,129,90,126,24,24,255,24,60
170 DATA 219,126,66,126,195,231,155,255,0,0,248,96,48,24,55,127
180 DATA 0,0,0,0,8,60,254,254,8,24,40,72,255,10,12,8
190 DATA 0,24,24,60,255,126,255,255,-1,0,0,0,0,0,0,0,0
195 FORT=0TO7 READA POKE7424+T,A NEXT
200 PRINT"♫" POKE36879,8 POKE36869,255
210 PRINT"▒▒▒  GRAPHIC SYMBOLS    "
215 PRINT
220 PRINT"▒ @  ▒▒LASER"
221 PRINT
225 PRINT"▒ A  ▒▒PLANET SURFACE"
226 PRINT
230 PRINT"▒ B  ▒▒STARS (HARMLESS)"
231 PRINT
235 PRINT"▒ C  ▒▒LANDING CRAFT"
236 PRINT
240 PRINT"◣ D  ▒▒MINES (DEADLY)
246 PRINT
250 PRINT"▒ E  ▒▒LANDING PAD
256 PRINT
260 PRINT"▒ FG ▒▒MOTHEP SHIP
266 PRINT
270 PRINT"▒ I  ▒▒LASER TOWER'
276 PRINT
277 PRINT'▒▒▒ HIT A KEY WHEN READY"
278 GETA$ IFA$=""THEN278
310 PRINT"♫" POKE36879,26 POKE36869,240
320 PRINT'▒▒▒▒INSTRUCTIONS (Y/N)
330 GETA$ IFA$=""THEN330
340 IFA$="Y"THENPRINT"♫" GOTO370
350 IFA$="N'THENPRINT'♫" GOTO7000
360 GOTO330
370 PRINT'YOU ARE GUIDING YOUR  SHIP DOWN TO THE      SUPFACE OF THE RED    PLAN
ET.
375 PRINT
380 PRINT"YOU HAVE TO MISS      THE MINES AND LAND    YOUR CRAFT SAFELY ON  LAND
ING PAD
385 PRINT
390 PRINT"FOR EACH SUCESSFUL    LANDING YOU GET 10    POINTS.
395 PRINT
400 PRINT"AFTER THREE           CONSECUTIVE LANDINGS  YOU GET A BONUS TAKE  OFF.
405 PRINT
410 PRINT"▒ HIT A KEY WHEN READY"
420 GETA$ IFA$=''"THEN420
430 PRINT'♫'
440 PRINT
445 PRINT'HERE YOU SCORE BY     RAMMING THE MINES     (10 POINTS PER MINE)"
450 PRINT
455 PRINT"YOU MUST RETURN TO    YOUR WAITING MOTHER   SHIP TO AVOID LOSING  A LI
FE"
460 PRINT
465 PRINT'ALSO IF YOU DRIFT     INTO THE LASER RAYS   THEN YOU WILL AGAIN   PERI
SH'
470 PRINT
475 PRINT"BEWARE                                      THE BLACK MINE !'
480 PRINT"▒▒ HIT A KEY WHEN READY'
490 GETA$ IFA$=''THEN490
500 PRINT ♫'
505 PRINT"▒▒▒      CONTROLS
510 PRINT ▒▒   . . LEFT & RIGHT
520 PRINT
```

```
525 PRINT"■   H FOR ABORT"
530 PRINT"▓▓▓▓      OR JOYSTICK"
535 PRINT"■▓▓ FIRE BUTTON TO ABORT"
540 PRINT"▓ HIT A KEY WHEN READY"
550 GETA$ IFA$=""THEN550
7000 PRINT"▓"
7010 STOP
```

Jellypuss

H Armstrong sends this Vic 20 game from Caterham

THE OBJECT of Jellypuss is to get your diver safely to the marine castle

Blocking your way are a variety of nasty submarine creatures, and to avoid them you must use the keys A and D to move left and right

You'll hear a sound effect every time you reach the castle

Program notes

0; sets sound effects
1, GOSUB to hi-res graphics
3, GOSUB to instructions
5; clears screen, sets score to 0
6, GOSUB to routine setting number of lives you require
350-630, sets up main title
631, music for start of game
640 prints score and lives
670-700, prints five Jellypusses in random positions
710-720, prints castle in random position
740-760, prints diver
770, tests to determine whether diver has reached bottom of screen
772, tests to see if lives = 0
780-790, moves diver
800-880; tests to see if diver has collided with Jellypuss
890-950; tests to see if diver has reached the castle
2000-2020; another go?

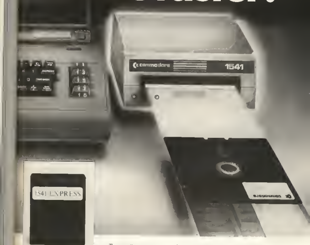
You can alter the number of lives allowed by modifying 5000-5052

```
0 V1=36878 S1=3687
1 GOSUB3000
3 GOSUB6000
5 PRINT"▓■" POKE36879,45 SC=0
6 GOSUB5000
340 PRINT
350 POKE36878,15 POKE36876,180 FORT=1TO400 NEXT POKE3687
600 PRINT"▓" POKE 269,255 PRINT"▓▓▓▓▓▓▓▓▓▓JELLYPUSS"
610 PRINT"▓▓▓▓▓▓▓▓▓▓B▓ HA■"
620 PRINT"▓▓▓▓▓▓▓▓▓▓▓HIT■ ▓ANY■ ▓KEY■"
630 GETA$ IFA$=""THEN630
631 PRINT"▓" FORPU=15TO0STEP-1 POKE36878,PU
633 FOROH=1TO00 NEXT
634 FORIW=220TO240 POKE36876,IW NEXT NEXT
640 PRINT"▓▓SCORE=",SC PRINT"▓▓▓▓▓▓▓▓▓▓▓▓LIVES=",LI POKES1 0
670 FORL=1TO5
675 E=INT(RND(1)*190)+7834
680 POKEE,1 POKEE+1,2 POKEE+21,3 POKEE+22,4 POKEE+23,5
690 POKEE+43,6 POKEE+44,7 POKEE+45,8
700 NEXTL
710 D=INT(RND(1)*123)+7885
720 POKED,11 POKED+1,12 POKED+22,13 POKED+23,14
740 H=7713
750 POKEH,9 POKEH+22,10
760 H=H+22
770 IFH>8164THENLI=LI-1 GOTO640
772 IFLI=0THENPRINT"▓▓YOUR SCORE=■",SC GOTO2000
775 FORT=1TO30 NEXT POKEH-22,32
780 IFPEEK(197)=18THENH=H+1 POKEV1,15 POKES1,190 POKEH-1,32 POKES1 0
790 IFPEEK(197)=17THENH=H-1 POKEV1,15 POKES1 190 POKEH+1,32 POKES1,0
800 IFPEEK(H+22)=1THENLI=LI-1 GOTO640
810 IFPEEK(H+22)=2THENLI=LI-1 GOTO640
820 IFPEEK(H+22)=3THENLI=LI-1 GOTO640
```

```
830 IFPEEK(H+22)=4THENLI=LI-1 GOTO640
840 IFPEEK(H+22)=5THENLI=LI-1 GOTO640
850 IFPEEK(H+22)=6THENLI=LI-1 GOTO640
860 IFPEEK(H+22)=7THENLI=LI-1 GOTO640
870 IFPEEK(H+22)=8THENLI=LI-1 GOTO640
880 IFPEEK(H+22)=9THENLI=LI-1 GOTO640
890 IFPEEK(H+22)=10THENSC=SC+10 POKES1 230 GOTO640
930 IFPEEK(H+22)=11THENSC=SC+10 POKES1,230 GOTO640
940 IFPEEK(H+22)=12THENSC=SC+10 POKES1,230 GOTO640
950 IFPEEK(H+22)=13THENSC=SC+10 POKES1 230 GOTO640
1000 OOTO750
2000 PRINT"▓▓▓ANOTHER GO?"
2010 POKE196,0 INPUTG$ IFG$="Y"THENGOTO5
2020 IFG$<>'Y'THENPOKE36869 240 PRINT'▓' END
3000 PRINT"▓▓▶▶▶▶▶PLEASE WAIT▓" FORA=0TO511 POKE7168+A,PEEK(32768+A) NEXT
4040 DATA0 [illegible] 1 [illegible] 224,64 ,8
4050 FORB=716[illegible]TO71[illegible]5 READC POKEB,C NEXTB
4070 DATA0,0 0,0 0,32,32,19,0 0,0,0 0,128,128,0
4080 FORD=71[illegible]TO7190 READE POKED,E NEXTD
4090 DATA3 [illegible] 1,0 0,1,20,156,99,34 255 41,41 145
4100 FORF=7191TO7205 READG POKEF,G NEXTF
4110 DATA0 0 192,106,0,0,0,0,1,1,0,0,0,0,0,0
4120 FORH=7206TO7220 READI POKEH,I NEXTH
4130 DATA16,8,0,0,0,0,0 0,192,0,0,0,0,0,0,0
4140 FORJ=7221TO7225 READK POKEJ,K NEXTJ
4160 DATA0 24,36,189,189 124,60,60 66,36 36,102,0,0,0,0
4170 FORL=7226TO7250 READM POKEL M NEXTL
4190 DATA168,248,248,248,216 216,216 221,21,31,31,31,27,27,27,91
4200 FORN=7251TO7265 READO POKEN,O NEXTN
4220 DATA255,255,207,206,206,206,254,254,255,255,243,115,115,115,127 127
4230 FORP=7266TO7287 READQ POKEP,Q NEXTP
4250 RETURN
5000 PRINT"▓▓[illegible] HAY LIVES(1-4 '
5010 INPUTFH$
5020 IFFH$<"1"ORFH$>"5'THEN5010
5030 IFFH$='1'THENLI=1 RETURN
5040 IFFH$ [illegible] THENLI=[illegible] RETURN
5050 IFFH$= 3'THENLI=[illegible] RETURN
5060 IFFH$="4 THENLI=4 RETURN
5060 RETURN
6000 PRINT"▓▓▶▶▶▶▶INSTRUCTIONS▓"
6010 PRINT ▶▶▶YOU ARE A DIVER'
6020 PRINT ▶▶▶WHO HAS TO GET'
6030 PRINT"▶TO THE MARINE CASTLE"
6040 PRINT ▶▶▶SAFELY AVOIDING"
6050 PRINT"▶▶▶THE JELLYPUSS
[illegible] PRINT"▓▓▶▶▶▶▶▶▶CONTROLS▓
[illegible] PRINT ▓▓▶▶▶▶▶▶ - [illegible]
[illegible] PRINT'▶▶▶▶▶▶▶ - [illegible]T'
[illegible] PRINT ▶▶▶▶▶▶▶▶ [illegible] KEY▓
7000 GET[illegible] IF[illegible] RETURN
7010 RETURN
```

Send us your Commodore programs, enclosing a cassette — and a printout on plain white paper if possible. Each listing must be accompanied by a typewritten introduction describing the program and explaining how it is constructed. We pay £6.00 for each bug-free listing published. We cannot guarantee to return every program submitted so please keep a copy. If you want us to return your listing you must include a stamped, addressed envelope. If you have any problems with the programs, please write to the appropriate author, Software File, Commodore Horizons, 12-13 Little Newport Street, London WC2B 3LD

Drive faster!



Theres nothing worse than waiting for your program to load. And good though the Commodore 1541 is, speed isn't exactly its biggest feature

Hook up the new 1541 Express from RAM though and you ll be up and running like lightning

This ingenious add-on speeds up data transfer from the 1541 and new 1542 disk drives to your Commodore 64 So much so that you ll wonder how you ever found the patience to wait before

With the Express you can load programs in a third of the normal time· That means less frustration and less time wasted

(You can fit it yourself in minutes, too – and disconnect it just as easily)

The new 1541 Express from RAM

To shift your drive into top gear call into your nearest dealer today

Or call our credit card hot line on 02514 25252. (Access and Visa welcome)

Or complete the coupon below and send it today to Dept CH Ram Electronics (Fleet) Ltd, 106 Fleet Road, Fleet, Hampshire GU13 8PA.

24 Hr despatch for credit cards and postal orders.

Please send me·

_____ 1541 Express High Speed Disk Loading Cartridge(s) at **£49 95** *+ £1 p&p (overseas orders £3 p&p)*

I enclose cheque/postal order or charge Access/Visa for £ _____

☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Name _____

Address _____

_____ Post Cd _____

Tel _____

[illegible]

Trade and export enquiries welcome.

CHROMASONIC PERSONAL COMPUTERS

48 Junction Road Archway London N19 5RD
Tel 01 283 9493 and 9495
238 Muswell Hill Broadway Muswell Hill London N10
Tel 01 883 3705

WELCOME TO THE WORLD OF COMMODORE

Maintenance, Service, Support, Training
all from your No.1 Commodore centre

Commodore 16

THE STARTER PACK

Commodore 16 computer
Cassette unit
Intro to basic part 1
Four games

£139 99

Commodore 64

Commodore 64 computer	195 95
SX64 portable computer	795 00
1530/1 cassette unit	39 10
Super Saver cassette unit	49 05
1541/2 disk drive	195 95
1520 printer/plotter	99 99
MPS801 dot matrix printer	195 95
MPS802 dot matrix printer	495 95
MCS801 colour printer	399 99
DPS1101 daisy wheel	999 99
1701/2 colour monitor	195 95
Z80 card	50 00
Commodore joystick	6 90
Quickshot II joystick	10 50
Commodore paddles	13 50
Microguide	5 95
Plinth for 64 system	24 95
Superbox 64 (inc. IEEE)	94 95
Vic switch	97 75
RAM & IEEE interface	69 95
Surge protector plug	12 95
CBM64 to centronics int	60 95
CBM64 to Epson interface	61 95

Plus 4

THE OFFICE AT HOME

Built in software
Wordprocessor
Database
Spreadsheet
Business graphics

£299 99

Commodore 64

Professional System

Commodore 64 computer
1541 disk drive
MPS801 dot matrix printer

FREE SOFTWARE

Easyscript (word processor)
Easyfile (database)
Intro to basic part 1

FREE MEDIA

Box of 10 disks
Box of paper

£599 00

Commodore 64

Starter Pack

Commodore 64 computer
Cassette unit
Intro to basic part 1
Quickshot II joystick
Game of our choice

£255 00

Monitor's

Commodore 1701	195 95
Microvitec 1031AS	250 95
Philips 12" green	79 35
64 Philips cable	2 50
Monitor plinth	11 50

Printer's

RX80T	220 85
RX80F/T	274 85
RX100	462 75
FX80	370 85
FX100	545 95
RX100	408 75
LQ1500	1092 50
Juki 6100	396 75
Daisystep 2000	320 90
Ibico LTR 1	220 00
64-centronics	19 95
Software for above	7 95

Commodore 64 guaranteed for 2 years

Terms

All products are guaranteed for 1 year unless otherwise stated. Payment may be made by Access Barclaycard Bank ers draft, Building society cheque cash or Postal order. Sorry cheques need 5 days for clearance. We reserve the right to change prices without prior notice. **All prices are inclusive of VAT**

Please check before ordering for carriage charges

64 Software

	cass/disk		cass
Summer Games	14 95/17 45	Flight Simulator II	42 95
Jet Set Willy	7 95	Boulder Dash	8 95
Zaxxon	9 95	International Soccer R	14 90
Spitfire Ace	9 95/12 95	Battle for Midway	9 95
Superbase	88 00	Ghost Busters	9 99
Fort Apocalypse	9 95/14 95	Daly Thompson's Dec	7 90
Bruce Lee	14 95/14 95	Decathlon	9 99
Solo Flight	14 95/14 95	Pitfall II	9 99
Beachhead	9 95/12 95	Fire Quest	9 95
Havoc	9 95	High Noon	7 90

cass= cassette disk= diskette R= rom

Media Supplies

Diskettes
Disks by Verbatim
SS/DD 40Tr 17 95 SS/DD 80Tr 24 75
DS/DD 40Tr 28 92 DS/DD 80Tr 32 75
Lockable disk storage boxes 50/80 16 50/25 25
Disks are supplied in boxes of 10

Computer listing Paper
11x8 5 13 80 11x9 5 12 65 11x15 5/16 15 52
Paper is supplied in boxes of 2000 sheets

Printer ribbons
MPS801 6 99 RX80/FX80 5 00 Daisystep 5 50
MPS802 7 99 1515/1525 6 25 Juki 1 85
We also supply a range of dust covers Daisy wheels and other ribbons

Maintenance, Service, Support, Training, Installation all from Chromasonic business systems

Special Offer

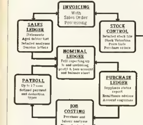
For further details of a very special offer of FREE SOFTWARE

WORDPROCESSOR DATABASE SPREADSHEET with every purchase of a Commodore business system PHONE US NOW

The Pegasus System

STAND - ALONE OR FULLY INTEGRATED

Fast precise accounting power
right at your fingertips


INVOICING
With Sales Order Processing
SALES LEDGER
Statements
Aged debtor list
Detailed analyses
Overdue letters
STOCK CONTROL
Detailed stock file
Stock Valuation
Price lists
Purchase orders
NOMINAL LEDGER
Full reporting up to and including profit & loss account and balance sheet
PAYROLL
Up to 17 user defined payment and deduction types
PURCHASE LEDGER
Suppliers status report
Remittance advices
Account enquiries
JOB COSTING
Purchase and labour analyses
Time sheet entry
Full cost reports

Phone us now to see how Pegasus accounts programs can help you and your business

Commodore

8296D

128k Computer,
integral disk drive
and monitor

FREE

Wordprocessor, Database Spreadsheet and DOT MATRIX PRINTER

£1690.00 +VAT

Superoffice

The Ultimate Commodore Office Administration System

The complete office automation system with ***Full Records Management, Calculation, Word processing and Spell Checking***

Commodore Business Equipment

8296 128K Computer	£715.00
700B 128K Computer W/O monitor	£535.00
710B 128K Computer with monitor	£760.00
720B 256K Computer with monitor	£895.00
SFD1001 Single disk drive	£445.00
8250 Dual disk drive	£805.00
4023 Dot matrix printer	£310.00
1361 Dot matrix printer	£560.00
Pet to IEEE cable	£27.00
IEEE to IEEE	£31.00

Terms of Business

All products are guaranteed for 1 year unless otherwise stated. Payment may be made by Access, Barclaycard, Banker's draft or Building society cheque. Sorry cheques need 5 days for clearance. We reserve the right to change prices without prior notice. **All prices are exclusive of VAT**

REAL ARCADE ACTION!
FROM JETSOFT
FAST LOAD 2 minutes
FAST LOAD 1½ minutes
FAST LOAD 1½ minutes
All 3 games for Commodore 64
BMX
Cavelon II
Quari
the arcade people
JetSoft

Cavelon II Can you destroy the wicked wizard of castle Cavelon? Only after negotiating the six levels in his castle. Collect all the door pieces before you can attain the next level. Help is at hand in this all thrills all action real arcade game when excalibur appears: achieve indestructability.

Quari

27 levels of increasingly difficult real arcade action. Based on the game Bongo, you must avoid the chasing dinosaur, pterodactyls, falling rocks, native spears and bouncing Bongos. Negotiate rope bridges and erupting volcanoes, picking up the treasures of a lost civilisation as you go, and finally cage the dinosaur – if you can!

BMX STUNTS

BMX STUNTS Based on the original arcade game this action packed game challenges your skill over six levels: straight runs, wheelies, ramp jump, slalom, bunny hops and the ultimate test over a V.W. [illegible] in the Beetle ride

061 775 0333

COMMODORE 64

OXFORD PASCAL

YOUR FUTURE WITH COMPUTERS DEPENDS ON PASCAL

BECAUSE

- PASCAL is the world's most popular programming language after BASIC
- PASCAL is FAST – up to 20 times the speed of BASIC

WHAT IS OXFORD PASCAL?

OXFORD PASCAL is a COMPLETE implementation of the popular programming language PASCAL running on the Commodore 64

GRAPHICS & SOUND

With the OXFORD extensions to PASCAL you can programme dazzling graphics and astounding sound

WHAT DO I GET?

With the cassette version of OXFORD PASCAL you get:

- A powerful text editor for preparing PASCAL programs
- A resident compiler giving 14k of user RAM
- A powerful set of colour graphics and sound extensions to standard PASCAL.

With the disk version of OXFORD PASCAL you get:

- All the above, PLUS
- A full disk to disk compiler exploiting the entire memory of the 64 for PASCAL programs.

HOW MUCH DOES OXFORD PASCAL COST?

Cassette version (resident compiler only)	£14.95
Full disk compiler (1541, 4040, 8050, 8250 drives)	£49.95

Prices are exclusive of VAT. There is also a small charge for post and packing.

Oxford Computer Systems
(Software) Ltd
Hensington Road,
Woodstock,
Oxford OX7 1JR, England
Telephone (0993) 812700
Telex 83147 Ref OCSL

Mind Stretchers?

Book: *Commodore 64 Mind Stretchers*
Author: *Ian Creasey*
Publisher: *Sigma*
Cost *£6 25*
Reviewer: *Dafna Erskine*

This book contains a mixture of games and utilities — some 40 programs in all There is a sprite editor, a character editor and old favourites like Mastermind, Snake, Life and Poker

There is nothing particularly wrong with this book, except that it is two years late The days when you could put out books of '40 best programs for your — — ' are long gone Micro users are now much more discriminating

Given the flood of computer books over the past year, there is surely little scope for titles which do no more than bundle collections of programs together More imagination please

Beginners guide to the Vic 20

Book: *The Incredibly Easy Way To Program Your Vic 20!*
Author: *Peter Stanhope*
Publisher: *Interface*
Price: *£3 95*
Reviewer: *David Shepherdson*

If you've struggled with the manual, then this is the book you've been waiting for! That's how the book starts off, and it indicates what level it is aiming for, but if you have mastered the manual, don't let that put you off considering this book It is one of the best I have yet seen from Interface Like many of their books, it is well printed and prepared, it is very easy to read and easy to follow, even for an absolute beginner Unfortunately it does have about two printers errors in each of the 12 chapters, but that shouldn't spoil your enjoyment Also, the author has a refreshing sense of humour which shows that he has enjoyed writing the book

The book has been set out with plenty of example programs, with lots of bold print for emphasis, and throughout the book large clear print is used, so if you've been staring into a screen for hours, this book shouldn't give you any problems

Stanhope takes you from simple things like how to set up your new computer, use of the cassette and keyboard, through to how to make the most of PEEKs, POKEs and Strings, and also touches on the available peripherals

The author himself states this is a book for the absolute beginner — well, it is, but it could also be a valuable addition to anyone who has perhaps moved up to a Vic The programs included range from simple conversion programs to Hi res and educational games Considering the price of many books these days, you could do a lot worse than buying this one

After the arcade

Book: *Working With Easy Script*
Author. *Randall McMullan*
Publisher *Granada*
Cost *£5 95*
Reviewer: *Sheila Ross*

When arcade games begin to lose their thrill, when the thought of zapping yet another alien begins to pall, most micro users turn towards more serious applications Perhaps the most common serious use of micros is word processing For 64 owners, this generally means *Easy Script*, which is Commodore's own brand word processor for the 64

In *Working With Easy Script*, Randall McMullan adopts a straightforward approach, encouraging the reader to start word processing immediately and learn by doing All the basic commands are here, from inserting and deleting text to mail merge and page size There is even a sample letter from Mark Carrington to JR Ewing — Randall McMullan must be a *Dallas* fan!

This book will be more useful for beginners than for experienced users, but there is something for almost everyone The only real criticism is that the section on printers and print effects is rather skimpy, but then it is a topic which deserves a book in its own right

Advanced handbook

Book: *The Advanced Commodore 64 Handbook*
Authors *Peter Lupton and Frazer Robinson*
Publisher *Century*
Cost *£6 95*
Reviewer *Phil Bonner*

Let us suppose you are an enthusiastic user of a 64, who is proficient in Basic and would like to go further You have examined Commodore's *Programmer's Reference Guide* but find parts of it too technical You would particularly like to experiment with sound and Hi res graphics, in Basic and Assembler, to understand the Basic Interpreter and to add a few extra commands to Basic The trouble is that you have been unable to find a suitable book to assist you

Look no further! This superb volume is the very thing you need Intended as a companion to the *Commodore 64 Handbook* by the same authors, it stands on its own as a well written, informative and useful volume for any 64-owner's bookshelf As well as covering the points mentioned earlier it provides a comprehensive guide to the use of disks and printers in a manner far superior to Commodore's own offerings Add to this numerous listings of program examples and utilities, and you have a publication which is hard to resist

This is indeed a book to dip into at random and explore in depth It is packed with information presented clearly and logically, with several helpful appendices It would almost be worth £6 95 for the Hi-res routines alone My only criticism is of the index, which is practically non-existent, but compared with the rest of the book this is a minor irritant Highly recommended!

Learning with Adventures

Book. *Learning With Adventure Programs*
Author: *Rosetta McLeod*
Publisher: *Melbourne House*
Cost *£6.95*
Reviewer: *Jeremy Simon*

Computers in education is a much abused phrase While computers are often used in schools, it is usually for administration or computer studies There are depressingly few instances where computers are used in English, geography or biology

However, Rosetta McLeod has set out to show how computers can be used to teach a variety of skills including logic, use of English and map drawing

Concentrating on four commercially available adventures — *The Hobbit*, *Valhalla*, *The Quill* and *Snowball* — Rosetta McLeod explains how parents and teachers can set exercises and tests which draw on popular computer programs. For example 'Write a review of *The Hobbit* for inclusion in a computer magazine'

The book is illustrated with pictures and examples taken from Rosetta McLeod's pupils in Aberdeen An extremely interesting and worthwhile book, if a little pricey at £6.95

Ten out of ten for Rosetta McLeod

ADVERTISEMENT INDEX

3D Computers 82
64 Plus 64
64 Software Centre 28
64 Supplies Co 10
A & C Software 88
Abraxas 5
Activision Inside front cover
Ampliton 88
Anger Productions 82
Anirog 71
Astrocalc 88
Beyond 36
BSF 89
Calco 82
Cascade 48
Chromasonic 80 81
Commodore 12 13 33 38
Computerama 18
Digital Integration 11
Dynamite 52
Dynavision 88
Gilsoft 38
Hewson 86
J Morrison Micros 38
Jensen 88
Jetsoft 82
Jolly Rogers 64
Leisure Genius 21
Logic 3 48
Marcol 84
Micropower 47 87
Mirage 8
MPS 64
New Generation 40 41
Oxford 82
Peaksoft 38
Precision 82
Paton 14
Quicksilva 34
Rom 78
Shards 88
Solar 72
Sophisticated 62
Statesoft 88
Supersoft 24
Thorn EMI 4 28
Twilight 88
Voltmace 43
Zero 64

NOW AVAILABLE FOR YOUR 64

PARK OF DEATH	ENTER THE PARK AND BE PREPARED. YOU WILL NEED SKILL, QUICK REACTIONS AND LOTS OF LUCK TO FACE THE COUNTLESS DANGERS!	£4.49
CAVE QUEST	EXPLORE THE CAVES AND DESTROY THE MONSTERS BEFORE THEY DESTROY YOU.	£4.49
DISPLAY	ATTRACT ATTENTION WITH THIS MOVING MESSAGE DISPLAY PROGRAM. IDEAL FOR SHOPS AND EXHIBITIONS	£3.49
LIFE LINES	EXPLORE THE INNER REACHES OF YOUR MIND WITH THIS 3-IN-1 PROGRAM. BIORHYTHMS, E.S.P. TEST, DECISION MAKER	£3.49

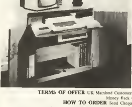
Please send Cheque or P.O. with order to
BIG SOFTIES
831 Stratford Road, Sparkhill, Birmingham

ARE YOU OFFERING A COMMODORE PROOUCT OR SERVICE?

Offer it where it'll be seen — £40 buys this space for one month and puts your business in front of thousands of proven Commodore enthusiasts and trade contacts nationwide

Call the **COMMODORE HORIZONS** Ad Dept
on **01-437 4343**
You could be here next month

NEW HOME COMPUTER CABINET
only £79.95
+ £5 DELIVERY



JUST CHECK THESE STANDARD FEATURES

1 Smooth sliding shelf locks in position just where you require it — and neatly glides away after use
2 The computer shelf has been designed to allow adequate 'Knee room' for you to sit comfortably and will avoid programmers backache
3 Adequate room to position tape recorder printer disc-drives etc alongside computer for ease of use
4 All cables neatly and safely out of sight while allowing all units to be permanently connected if desired
5 Lots of storage space for cassettes, cartridges books, listing paper, joysticks etc
6 With shelves and doors closed instantly becomes an elegant piece of furniture
7 The lower shelf accommodates all makes of video recorders currently available.
8 Smart teak effect finish
9 Supplied as a flat-pack Very simple to assemble using just a screwdriver Full instructions supplied
10 Measurements Height 32½ins, Width 36ins, Depth 16¾ins

TERMS OF OFFER UK Mainland Customers only Please allow up to 28 days for delivery
Money Back Guarantee
HOW TO ORDER Send Cheque or Money Order for £84.95 to
MARCOL CABINETS LTD , Solent Business Centre, Millbrook Road West, Southampton. Tel (0703) 774832 (24 hr answering service)
Showroom open Monday to Friday
or send SAE for colour leaflet of full range

ANSWER BACK

Standard abbrs.

WHEN TYPING in a program recently I discovered that standard abbreviations used in REM statements produce strange but consistent results when listed. P (Shift) 0 gives not POKE but PDATA for instance. How and why does it happen? And can Turbo loading programs such as a Fastback damage the computer in any way?
P Dent
Seaham

ALL UNSHIFTED characters after a REM will list correctly, but any produced by shifting those keyboard characters which produce graphics when shifted are interpreted as tokens, and converted into keywords. You can avoid this by placing them within quotes.

Thus when you enter P (SHIFT) O, the P is unchanged and the shifted O is converted into the keyword DATA. On other CBM machines the conversions may be different. However, if you use a line (on the 64 or any other Basic 2 machine) such as 10 REM 'shift' L, then all data after the shifted L will vanish, and the error message 'Syntax Error' will appear when listed.

I haven't heard of any damage being caused by turbo loaders, although I haven't tried the Fastback program you mention.

Restore line

I HAVE a book called *More Basic Computer Games*, and cannot make the longest game work because it uses RESTORE (line number) commands. I've tried a number of different ways of presenting these commands, but my 64 won't accept them. Can you help?
D Gill
West Timperley
Cheshire

SOME Basics have the command "RESTORE" line number" — CBM Basic does not. The data pointer is set to that line, not to the earliest DATA statement as is the case in Commodore Basic. You will have to amend the READ routine, and also use a marker as the first item of DATA on the line you wish to RESTORE.

```
10 READA$:IFA$<>
   "marker" THEN FOR
   I=1TO10:READA$:
   NEXT:GOTO10
20 READ A$
30 rest of program
40 data tag,1,2,3,4,5,6,7,8,
   9,10
50 data marker,11,12,13,14,
   15,16,17,18,19,20
```

64 to 3000

WILL YOU let me know if there is any hardware available which will let me use a Commodore Series 3000 disk drive and printer with my 64?
Ian Brydon
Farnham
Surrey

THERE ARE several suitable interfaces available, for instance the CBM64 IEEE 488 cartridge, price £59 plus VAT from JCL, 47 London Road, Southborough, Tunbridge Wells, Kent, phone 0892-27454. This allows the 64 to access and control all CBM IEEE peripherals. The cartridge plugs into the rear of the 64 and accepts a standard PET IEEE lead to connect to the first peripheral. Subsequent devices are daisy chained with standard IEEE/IEEE leads.

However, if the software you are running uses the space from $C800 to $CFFF then you cannot use this cartridge. In that case you might want to investigate the DAMS interface or the Interpod, now handled by Cheetah marketing and featured in October's *Commodore Horizons*.

PRG for paddles

CAN YOU give a short routine explaining the use of paddles? I have a pair lying around the house doing nothing because I don't understand how to use them!
Russell Burr
Backhead
Glasgow

THE ROUTINE for using paddles is rather long and incorporates some machine code. You'll find it listed and explained on pages 346-347 of the Commodore 64 Programmers Reference Guide.

Finding the address

IN THE August issue of *Commodore Horizons* there was a program called ADDRESS by Chris Payne. In order to get the program to work effectively, large amounts of data need to be stored on tape. Could you make some suggestions on how to arrange and store the required amounts of data, or suggest some books which explain data handling in full?
W Purewal
West Bromwich
Midlands

***Business Applications for the Commodore 64*, by James Hall, published by Sunshine, should be of great help to you. It contains programs and subroutines which deal with data handling both on disk and tape.**

Flashes and crackles

I HAVE recently purchased a Vic 20 for my son, and have been picking up interference on the screen, showing up as short flashes and crackles. The TV and the computer itself appear to be OK, but as we are about half a mile away from a Plessey factory it seems that the Vic is picking up some sort of signal. Can you suggest any way to shield or insulate it?

TRY A surge protector plug, which eliminates voltage surges on the mains. This could be caused by your being on the same circuit as Plessey's, or a local hospital, or even other electrical appliances in your own house. You can obtain such a plug for £12.00 from Bowthorpe EMP Ltd of Stevenson Road, Brighton, Sussex, BN2 2DF.

Expander in print

I HAVE RECENTLY purchased a Vic 20 with Super Expander, and I find it very hard to find any programs utilising the expander. Could you suggest any books?
Karl Sorrell
Tilgate
Sussex

YOU CAN find many programs using the Super Expander in a book called *Vic Graphics* by Nick Hampshire, costing £6.95 from Duckworths, The Old Piano Factory, 43 Gloucester Crescent, London. All the programs in the book are also available on cassette from the publishers.

Cobol query

I AM A relative newcomer to the world of computers, but I anticipate going to college later this year to take a fulltime course.

I've been told that it would be a help if I could gain some experience in Cobol, but I can't trace a supplier of a version of this language. Can you help?
Michael Fox
Kingsbury
London

COBOL on the 64 could only be used in conjunction with the new Commodore CP–M cartridge. CP–M is an operating system which allows access to a wide range of business programs, and you should be able to find a suitable version of Cobol once this cartridge is fitted. Unfortunately, at the time of writing, no firm release date has been set for the Commodore CP/M cartridge.

If you need help with a technical query or problem write to
Jack Cohen,
Commodore Horizons,
12-13 Little Newport Street, London
WC2R 3LD

CLASSIFIED

SOFTWARE

COMMODORE 64 DATABASE — DATAFILE

Powerful options include print all/selective records delete amend save load copy alphanumeric sort user defined fields memory check total numeric fields multi field interrelational global and between limits searches etc Fully menu driven with comprehensive easy to use instructions

CBM 64 (compiled) cassette £7 45
CBM 64 (compiled) disk £10 45

COMMODORE 64 WORDPRO — TEXTFILE

Powerful word processor facilities include — large text buffer auto centre variable tab insert amend delete copy move text word count right justify paging join files multiple file handling print all/part text etc Fully menu driven with comprehensive easy to use instructions Great value

CBM 64 (compiled) cassette £8 25
CBM 64 (compiled) disk £10 75

All programs with full documentation and guarantee and can be used with all direct connect CBM64 printers including 1520 printer/plotter Also most centronics (with suitable hardware interface) Price includes fast delivery by first class post Cheques/PO s to **A & C SOFTWARE**

51 Ashtree Road Tividale West Midlands B69 2HD

ANYONE INTERESTED in a multi colour Sprite generator a HI + RES drawing aid a complete Database and a Budget program for the CBM 64? If so send a blank tape and a cheque or P O for £3 95 (to address below) If no blank tape enclose 50p extra Allow 28 days for delivery enclose 20p p + p Gary Brennan 12 Bowmore Walk Shotts Strathclyde Scotland ML7 5JN

FORBIDDEN Forest Aztec Challenge Grid Trap and more for the CBM 64 For sale or exchange Send SAE for full list Finn Cheong 11 Winleigh Road Handsworth Wood Birmingham B20 2HN

SPECIAL OFFER for Commodore Horizons readers Buy your VIC 20 + 16K stock control at cost price only £9 50 with free data tape & full documentation This month only Martyn Carrick Wilson Hill Farm Skidby Cottingham HU16 5SR

CBM 64 Software to exchange/sell Titles include R A C Decathlon Foes Assembler Beach Head and much more Garry Tan 19 Wrigley Close Bury Lancashire BL8 1XD or Phone 061 761 4605 after 7 15 p m ask for Garry

FOR SALE the Hobbit and Solo Flight for CBM 64 Both new and unused £10 each Tel (073 721) 42348 after 6 p m

CBM 64 PROGRAMS to swap or sell Many titles including American Write to Stephen Kearon 22 Westminster Lawns Foxrock Dublin 18 Ireland Tel Dublin 885834

CBM 64 Software to swap Have many titles including some American Example Zaxxon One on One Send list to Gerry 22 Dauntsey Mews Bellvale Liverpool L25 2TG Merseyside all letters replied

COMMODORE 64 software for sale Wimbledon £4 50 Siren City £3 50 Star Commando £4 Hustler £3 50 Together sell for £13 50 Contact S Sung 1 Hurly Hawkin Bishopbriggs Glasgow G64 Send SAE with postal order if sold money returned

VIC 20 games for sale Computer War T of Evil Sub Commander at £5 each Snooker £6 Skramble Jetpac Arcade The Wizard and Princess K tel doublesider Amok Race Tornado Gridrunner and Roadrace cartridge £1 Ring Desmon on Stourbridge 392046 any time after 6 30 p m

COMMODORE 64 software for sale most half price Zaxxon £15 Jumpman £15 Aces + £4 Easy Script £30 original condition Also wanted Ringside Seat Seat Mule Combat Leader Axis Assassin Worms might swap Tel Waterlooville 266856 after 6 pm

COMMODORE 64 with cassette Joystick Software only ten weeks old £160 Tel 01-670 9972

NEW from Rocket Concepts Mastercode — a game of logic Robotron Attack and Space Station — arcade games only £2 95 each Also Stock Control and Telephone Directory programmes — for business and home use — both only £7 95 on disc or £5 95 on tape For orders or info contact Ian Hooper 28 Lordship Pk London N16 5UD Tel 01-800 7171

CBM 64 Software to swap many titles include Blue Max Revenge M C Neptunes Daughter Frogger Pole Position Pooyan and many others Interested then contact Gary Mem e c/o UFO 1st Black Watch BFPO 106

FOR VIC 20 I have 130 programs You can buy or exchange them My programs are Gridrunner Slot Machine Amok Abductor Slalom Sintetizzatore Vocale Anti Save Formula 1 Saigon Chess Zombies Rat Race Gorf Camel etc Silvio Polacco Melvane Street 00135 Roma, Italy

CBM 64 Software half price Practical 64 disc £20 Data Manager cassette £10 Data Manager disc £10 Ultysynth 64 cassette £8 Tel Walton on Thames (0932) 241242

CBM 64 Software for sale or swap £85 worth of software including Hobbit Manic Miner Voodoo Castle all originals on cassette The lot for £30 or nearest offer Phone (0472) 40088 and ask for Steve or write to 3 Harrington St, Cleethorpes Sth Humberside DN35 7AY Tel 0472 40088

CBM 64 software sale OFM database and labels (£30) £15 Turbo extended basic (£14 95) £10 Pilot 64 (£7 95) £4 50 Ripspeed 64 (£7 95) £4 50 Postage 50p Tel 01-590 2792

FOR SALE Radar Rat Race and Omega Race for VIC 20 Both unused — already got copies of both £5 each or £8 the pair Phone Nik on 07834 457 after 6p.m

VIZAWRITE and VIZASPELL on disk for Commodore 64 list £80 new £60 the pair Phone Dave 0797 80149 also Jumpman for sale £10

ADVENTURE GAMES computer games £3 50 each! For free leaflet send s a e to 31 Goddington Rd Bourne End

EASY SCRIPT W P package for CBM 64 disk Unopened offers Forest Rolo 3200 evenings

---

Here's my FREE Classified Ad.

(PRIVATE ADVERTISERS ONLY)

PLEASE WRITE YOUR COPY IN CAPITAL LETTERS ON THE LINES BELOW

NAME

ADDRESS

TELEPHONE

Please cut out and send this form to

CLASSIFIED DEPARTMENT
COMMDDORE HORIZONS
12-13 LITTLE NEWPORT STREET,
LONDON WC2R 3LD

CLASSIFIED

SUPER DISK utility for 1541/64 includes analyse and create errors Change heading/ID & examine programme addresses tool kit facility Only £7 75 from Martin Bodgee 123 Lower Brook St Basingstoke Hants

CBM 64 software Solo Flight Simulator £6 Snooker £4 3 D Time Tink £3 Flight 737 £3 Music Composer (cartridge) £5 books Tel Ruislip 35586

COMMODORE 64 C2N cassette joystick four books dust cover machine code book and tape plus £300 worth of top software Hobbit Decathlon Solo Flight and many more All boxed and as new £360 can deliver Tel 0830 57129

VIC 20

VIC 20 C2N cassette deck 3K Ram pack super expander cartridge mother board over 70 games and utilities including 40 column tape and compiler reasonable offers to Woking 67693

VIC 20 C2N & Rec 1520 printer plotter 16K switched Ram pack, 14 b/w TV, 4 games VIC Revealed Learn prog with VIC VIC Innovative Computing All hardware as new still in guarantee Total value £320 Will consider £250 O E Walker Coombe Gables Ongar Hill Addlestone Weybridge Surrey KT15 1DF Tel Weybridge (0332) 44114

VIC 20 Educational Software for sale O Level Revision tapes maths English language and biology As new £5 each They worked for me! Tel 0202 742452

SWAP VIC 20 C2N cassette deck 3K Ram super expander cartridge for CBM 64 disc drive or will sell. Offers to Woking 67693

VIC 20 + cassette deck + 16K Ram pack with Intro to basic PT1 joystick lots of games educational software books and magazines £200 Tel 452 2607 Ask for Sunil

VIC 20 for sale with Choplifter by Creative Software and Jelly Monsters (Pac Man) by Commodore and also with intro to basic and Quickshot 1 joystick all for £80 Willing to go lower than £80 Phone London 472 5002 anytime ask for Mr 9 Jean Pierre

VIC 20 with cassette recorder + switchable 16K Ram pack Mathematic-S 1 + £50 worth of games + Victape 1 2 3 + HI RES drawings with maps of the World and map of England Books like VIC 20 Exposed Getting the Most From Your VIC 20 and more All of this for £200 I sell for only £200 + p&p send to Habib Allahi 9 Colville Villas off Colville St Notts NG1 4HN

VIC 20 + C2N intro to Basic Part 1 assorted games and all leads excellent condition — still boxed £85 Phone 470 3884

VIC 20 24K RAM 3 Slot Mother Board Forth Cartridge Super Expander 40 column board programmers aid lots of software including Vicfile Books including reference guide Vic Revealed £350 ono Tel Ruislip 32649 Ask for Liam Graham

FOR SALE VIC 20 Cassette Deck 16K RAM Quickshot Intro to Basic 1 & 2 Prog Ref Guide Assembler Tutorial Software Dust Cover £160 ono Aldridge 54484

COMMODORE VIC 20 for sale VIC 20 package games (15) books introduction to Basic part 1 cassette deck and free blank cassettes Prize £80 90 also negotiable Please phone J Doshi after 5 p m on 01 767 0823

VIC 20 + 3K Alien Expansion Unit 7 Slot Switchable 13 cartridges incl Gorf Sargon Chess Mole Attack over 126 games incl Gripper Amok etc 7 books + mags £2 50 ono Bally 36 Moor Top Drive Hemsworth West Yorks

VIC 20 C2N cassette 16K Ram Machine Code Monitor Intro to Basic Part 1 prog Reference guide 7 games cartridges including Gorf etc £120 + worth of software Bongo Jetpac etc Four months old boxed, worth £400 bargain at £240 Tel 0583 921441

VIC 20 + CN2 + 32K Sw Ram pack 4 slot sw mother board, VICMON s/expander 1520 print/plotter Sargon 2 prog ref guide £200 worth of VIC books mags £100 worth of tapes dust cover All in new condition £600 worth will accept £260 M Grosvenor 4 Orkney Close Blackburn Lancs BB1 2JR

1984 VIC 20 data set + 2 month old 16K Vixen switchable Ram pack (3 8 16) 2 books £45 of software + 1 cartridge Sell complete £180 ono Contact S Shaw Aljun Tire 12 Lemon Grove Whitehill Bordon Hants GU35 9BE Tel Bordon 3863

VIC 20 home computer with cassette unit magazines intro to basic pack 1 and games £120 ono Tel Aylesbury 22310

FOR VIC 20 I have 130 programs You can buy or exchange them My programs are Gridrunner Slot Machine Amok Abductor Slalom, Sintetizzatore Vocale Anti Save Formula 1 Sargon Chess Zombies Rat Race Gorf Camel etc Silvio Palacco Molvene Street 00135 Rome Italy

CBM 64

CBM 64 C2N cassette command control joystick with over £300 worth of software books and magazines including Manic Miner Beach Head Logo Hunchback Solo Flight Falcon Patrol Hustler Snooker Flight Simulator introductory to Basic portable TV £270 Mr I Crosby 22 Adswood Hall Cres Adswood Stockport Cheshire Phone 061 456 0626

1984

A VINTAGE YEAR FOR COMMODORE HORIZONS

Back issues of Commodore Horizons are available If you only joined us part way through the year or missed an issue or two here's your opportunity to catch up on our 1984 coverage of everything Commodore

☐ **JANUARY'S** — Issue sold out

☐ **FEBRUARY** — Disk drives surveyed Logical thinking on The Vic and 64

☐ **MARCH** — Robots Customising The Vic and 64 character sets 64 breakout listing

☐ **APRIL** — First steps in machine code printers A look at networking

☐ **MAY** — Andromeda's Hungarian uprising A special feature on 64 music Ghostie listing for the Vic

☐ **JUNE** — Our Commodore show preview Turtle graphics A peaceful Sprite designer for the 64 A not quite so peaceful global war for the Vic

☐ **JULY** — Word processing and Mouse emulation for your 64

☐ **AUGUST** — Flight simulation — bit switching Relative files

☐ **SEPTEMRER** — Micronet vs Compunet Disk drives more memory for your 64 Bubble flus write us a program

☐ **OCTOBER** — Solar's BMX BBC's chip shop

☐ **NOVEMBER** — The Plus/4 and C16 Commodore conversations from Currah Steam heat from Tony Crowther's Joko listing

☐ **DECEMBER** — Ask your newsagent for further copies of this issue or write to us

The cost for each back issue is £1 including postage and handling Please make cheques payable to Commodore Horizons

Subscriptions for next year are available of course see the card in this issue

Please send orders to

COMMODORE HORIZONS (Rack Issues) 12/13 LITTLE NEWPORT ST, LONDON WC2R 3LD

CLASSIFIED

SOFTWARE

COMMODORE 64 Software 22 top titles including International Soccer Hobbit Manic Miner China Miner Hunchback Chinese Juggler etc etc £60 the lot! No offers No swaps All originals in excellent condition Tel Bradford (0274) 677163

CBM 64 games for sale Titles include Solo Flight International Soccer Space Pilot, Hover Bovver and much more Contact Sanjeev after 4pm weekdays Ring 01 808 6260

SUNARO

Fire Quest	8 75
Zork Trilogy (d)	31 50
Havoc	8 75
Zim Sala Bim	8 75
Kokotoni Wilf	6 25
Lazy Jones	6 90
Ghostbusters	8 75
Chartbusters	8 75
Summer Games c/d	13 25/17 50
Zaga Mission	6 95
Poster Painter	8 25
Storm Warrior	7 35
System 15000	11 50
Ankh	7 35
Games Creator	11 90
Brendans Basic	38 95

SUNARO SOFTWARE (CH1)
PO BOX 78 MACCLESFIELD
CHESHIRE SK10 3PF

64 SOFTWARE incl Beach Head Wimbledon Hobbit + many more All at half price Ring 01 464 6017 day 01-855 1265 eve ask for John Anderson Also like to exchange tips and certain software

FOR SALE — Easyfile for the Commodore 64 only £35 (R R P £50) Also Intro to Basic Part One only £7 (R R P £14 95) Unwanted gifts Tel 0558 622509 (quick)

CBM 64 Utilities for Sale VICSPRINT 64 Interface £12 50 Practicalc 64 (tape) £12 50 Everest Ascent £2 50 Shig of the Line £2 60 Introduction to Basic £ 500 Gemini Database £10 Quickchart 64 £3 00 Plus more Telephone 0734 698804 after 6pm

CBM 64 games for sale All originals cost £100 sell for £50 Includes Scope 64 Ultisynth Dancing Feats Slinky Daisy's Decathlon Flight 737 Aztec Challenge Bumpin Buggies, AMC RMC Tel David 01 508 5717 after 7pm

'GORTEK AND THE MICROCHIPS v g c £10 0354 55105 evenings

VIC 20 games — Rage Hoppit Type A Tune Blitz £6 Grid runner £3 Catch Snatch £3 Panic £3 The Count adventure cartridge £6, everything £18 David McKenzie 18 Oxhill Place Kell Park Dumbarton Scotland

COMMODORE 64 games to swap over 50 titles Also top American games e g One on One Pooyan Write to Jason Halliwell 293 Ainsworth Lane Bolton Lancs BL2 2QN or phone Jason Bolton 24624 after 5pm anytime during weekends

1541 Disk Management

For the Commodore 64 A menu driven 20 function disk management utility Features include edit track/sector disk back-up protect and unprotect programs plus 'enhanced' and normal disk commands Possibly the only disk utility you will ever need For the absolute beginner and expert user Supplied with comprehensive booklet on a quality disk for only £9 78 inc Cheque/P O or stamp for details to:
CLARK KENT SOFTWARE (DEPT CBM)
18 BAMBURG CLOSE CORBY
NORTHANTS NN18 9PA

VIC 20 Software for sale re Gorf and Cosmic Cruncher cartridges £5 00 each or £9 00 the pair Other software for sale Tel Felling 0632 690157 evenings

EXCEPTIONAL 64 SOFTWARE

BEST FROM THE U K		
Loco	Cass	£7 15
Guardian	Cass	£7 15
Arabian Knights	Cass	£6 20
D Thompsons Decathlon	Cass	£7 15
Death Star Interceptor	Cass	£8 20
BEST FROM THE U S		
Flak	Disk	£13 50
Caverns of Khafka	Cass	£8 05
Astrochase	Cass	£8 05
Zaxxon	Cass	£8 95
Beach Head	Cass	£8 95
Spitfire Ace	Cass	£8 95

EXCEPTIONAL PRICES

For full list please send S A E to —

LOADE ENTERPRISES
c/o Ensemble 35 Upper Bar
Newport
Shropshire TF10 7EH
Tel (0952) 813667 or 814292

FOR SALE

FOR SALE 64 games book and Quick Shot 1 joystick Sell for £10 or swap for Quick Shot 2 Will split Phone Newcastle 2842658 after 8 30pm Ask for Jamie

FOR SALE Vic-20 16K Switchable Ram Intro to Basic Part 1 games includes Submarine Commander Computer War Gridrunner mage and other software Excellent condition £100 Contact David 0836 714061 after 4pm

COMMODORE 64 with cassette deck and joystick Total of nine games which include Beach Head Kong and Hexpert Many books etc All in perfect order £205 o n o Must sell Crewe 662541

CBM 4032 Integral Screen Basic 4 Superchip Flochip Commende £295 Datasette £20 2031 Disc Drive plus extensive software £195 RX80 Printer £165 All excellent condition Manuals cables etc supplied Job lot £625 Telephone 0224 887484 after 6pm

ATARI VGS Pacman Superman Demon Attack Space Invaders Star Raiders and Touch Pad Combat Haunted House Soccer Basic programming and keyboard controllers shop price £365 mine £185 or swap for CBM 64 Phone Yapton 553088 Ask for Ian after 4pm

FOR SALE One Pro Ace joystick used only 3 times since bought in July this year Excellent condition Cost £14 sell for £10 00 (still in box) Suitable for CBM 64 Vic 20 Atari and many other home computers 061 747 6456

CBM 64 Software to swap Over 70 titles incl Valhalla Quasar Galaxian A M C R M C Blagger as well as American programs E6 Zaxxon Fort Apocalypse Baseball All on cassette and disk Phone Scott after 6pm on 021 783 0278

CBM64/VIC 20 DIRECT CONNECT MODEM
Intelnet Model 2064/21/27 300 Baud
- *Plugs into the User Port of CBM64 or VIC 20 (3 line interface)
- *Requires NO EXTERNAL INTERFACE OR POWER SUPPLY
- *Switchable ORIGINATE/ANSWER TEST HALF FULL DUPLEX (Non Approved)
- *Introductory Price £49 50 Cheques/PO to INTELNET LTD Unit C2 3 to Creekside LONDON SE8 3DX

SWAPS

WANT TO swap my Pearce Simpson Tiger Mark 2 40 Channel AM C6 Rig with 4ft twig antenna v g c for CBM 64 software Telephone 874-4558 (evenings)

FINNISH 64 user wishes to swap or buy CBM 64 software on disk Please send your list to Peter Abbott PO Box 47 02660 Espoo 66 Finland

COMMODORE 64 software to swap Top British and American titles available Phone Graeme on 0385 23367

COMMODORE 64 software to swap many titles including American Contact Garry on 051 487 3262 or write to 22 Dauntsey Mews Bellevale Liverpool L25 2TG, Merseyside

CBM 64 software to swap many British and American titles e g Zaxxon Pitstop One-on-One E T C Send lists to David Miley Helmsley Red Hall Drive Cochrane Park Newcastle upon Tyne P S I have disk and tape software

CBM 64 software to swap or sell Titles include the Hobbit Valhalla Scramble 64 A M Camels and many more Send s a e for list of these excellent games 34 Wilton Gardens Cork Ireland

WANTED 1541 disc drive for Commodore 64 plus any extras e manuals discs and games if possible? Price negotiable about £125 Phone Stevenage 359583 and ask for Tony evenings

WANTED Oxford Pascal Disk swap S A M Speech Synthesizer or Simons Basic or games on disk Write B Bradley 54 Ashwood Rd Clondalkin Dublin 22 Ireland

1525 PRINTER manual wanted Photo copy will suffice Contact Terry Hart 17 Burns Gardens Lincoln Tel 29643 or 29931 ext 368

WANTED Mastercode Assembler £8 F 15 Strike Eagle £8 Spitfire Ace £4 60 Hobbit £6 Flip Flop £4 50 Kotoni Wilf £3 50, Valhalla £5 Boulder Dash £4 Quo Vadis £4 Phone Dave (0734) 788130

I WOULD like to join a Commodore 64 Users Club within 5 miles of Stretford Manchester If there is such a club Please contact Gary Knowles 50 Norway Street Gorse Hill Stretford Manchester 061 864 1664 evenings

WANTED word processor for CBM 64 Must be cheap and easy to use (Disk preferred) Phone Mackenzie (0302) 744721 evenings

VIC 20

COMMODORE Vic 20, C2N cassette software worth £60 Boxed as new Cost over £200 Will accept £100 o n c Tel (0323) 886425

VIC 20 plus over £300 worth of software including titles — Gorf Skramble plus three Scott Adams adventures £150 o n o Phone Winchester 862441 (Mark)

VIC 20 plus Stack Storeboard with 8K expansion and Vickit 2 programmers aid and hi res Ram plus Vicmon machine code monitor cartridge All in perfect condition £95 Ring 0304 813000 (Canterbury area)

BARGAIN Vic 20 with 16K Ram 2CN cass player over 175 programs mostly arcade adventures music utilities and originals Books leads magazines all boxed as new leads manuals cost over £400 must sell reluctantly accept £125 o n o Tel 746 7325

A FREE LIGHTPEN!

Yes a FREE Light Pen! with every **GRAPHKIT**! Graphkit is the ultimate in drawing! designing! or painting! (using the light pen of course which incidentally has a full 3 year warranty!) Graphkit will amongst other things allow you to

- Draw free handed on the screen anything from a Micky Mouse to your latest integrated circuit! With all the fill colour and erase facilities of course!
- Save/load your latest master piece to/from the disk/tape drive
- Or directly copy the drawing on the screen to the printer! And keep it for ever or send to a friend as a post card!
- Design your own colourful sprites and characters
- Play the games in the package! or use the light pen in your own games/education/programs

GRAPHKIT is available on disk and tape. Tape version is £1595 and disk version (recommended) is £19 95

All you 1540/1541 disk users **DMON**! is here at last. Dmon is the disk monitor you have been waiting for It will allow you to

- read/write blocks from/to the disk
- display and edit blocks on the screen
- display and send disk messages/commands
- transfer your programs from tape to disk or disk to disk or even disk to tape! ● and more!

DMON comes on DISK at only £9 95

Do you use tapes? Are you sick and tired of waiting for your programs to be Loaded/Saved from/on the tape? Then you need a **TORNADO**!! Tornado allows you to Save/Load/Verify your Basic/machine code programs faster than a CBM 1541 disk drive does! Due to popular demand! Tornado now comes with new and more powerful commands plus extra instructions to assist you in making fast versions of your existing machine code/Basic programs. Tornado is available on tape for CBM 64 and 8K + Vic 20

Do your Run/Stop and Restore keys often fail? Do you want to come out of those crashes?! Or get into those unbreakable programs?! Then what are you waiting for, get yourself a **BREAKER**!! Reset switch and let your computer know who is the boss!! Breaker can be connected to your machine in seconds, no soldering. Included with the Breaker is a copy of basic recovery software on tape. Now available for any CBM 64 or Vic 20

A FREE BREAKER WITH EVERY TORNADO IF YOU USE THE COUPON BELOW NOW!

BSF CSL, 82 FURNACE DRIVE, CRAWLEY, W SUSSEX RH10 6JE.

Please send me ____ Tornado at £9 95 + my free! Breaker

Please send me ____ Breaker at £7 95

Please send me ____ Rom File at £7 95

Please send me ____ Lightpen at £11 95

Please send me ____ Graphkit at £15 95 (tape)

Please send me ____ Graphkit at £19 95 (disk)

Please send me ____ DMON at £9 95

I enclose cheque/PO/cash to the sum of £ ____

Name ____ Computer

Address ____

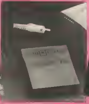
Tel

Please use this form and block letters only. All prices are inclusive of p&p (mail order only add £2 if outside UK) Please post to

BSF CSL, 82 FURNACE DRIVE, CRAWLEY, WEST SUSSEX RH10 6JE

Eureka!

Win one of ten CURRAH Speech 64 units



ARCHIMEDES the Greek mathematician, is the inspiration for this competition sponsored by **Domark**, the company responsible for the remarkable new multi-part adventure **Eureka!**

Ten prizewinners will receive Currah Speech 64 voice synthesizers, for the Commodore 64. This unit, reviewed in last month's Commodore Horizons, "speaks" in four different voices and can be programmed in Basic to produce any words you want.

Since the prize is so talkative, the competition is all about words — how many English words of four letters or more can you make from the name ARCHIMEDES?

No proper names, plurals, or abbreviations are allowed. When you've completed your list, fill in the competition form and post it to the address given. Don't forget to complete the tie-breaker in an apt, amusing and original manner in 15 words or less.

The ten entrants who give the largest correct lists of words will win the speech synthesisers.

Usual competition rules apply, and the Editor's decision is final. Closing date is the last working day of December.

I DISCOVERED ☐ WORDS. THEY ARE: ____________

Use extra paper if necessary

TIEBREAKER Speech 64 says it all because ____________

NAME ____________

ADDRESS ____________

POST TO Eureka Competition, Commodore Horizons, 12/13 Little Newport St, London WC2R 3LD

SPECIAL OFFER
Deduct £1 per cassette when ordering 2 or more.

AT LAST ... SUPERIOR SOFTWARE FOR THE COMMODORE 64 COMPUTER

COMMODORE 64

SMUGGLER £7.95

A fast-action arcade-style game Your aim is to catch the falling barrels and throw them into the ship Twelve separate screens with fascinating graphics including kangaroos octopuses, penguins, birds biplanes fork-lift trucks conveyor belts lifts and walkways The high-score table can be saved and loaded from tape and the program includes a demonstration mode (JOYSTICKS ONLY)
●●●*NEW RELEASE*●●●

MR. WIZ £7.95

From the author of Percy Penguin Mr. Wiz is a superb arcade type multi-scene game Guide Mr. Wiz around the garden to eat the cherries whilst avoiding the evil gremlins The gremlins can be killed by dropping apples on them or by throwing the crystal ball Extra points can be gained by eating the magic mushroom, but beware this is the home of the gremlins and makes them permanently furious!
(KEYBOARD OR JOYSTICKS)
●●●*NEW RELEASE*●●●

"MR. WIZ" IS ALSO AVAILABLE FOR THE B.B.C. MICRO AND ACORN ELECTRON, AND "WORLD GEOGRAPHY" IS AVAILABLE FOR THE ACORN ELECTRON. ALL CASSETTES ARE £7.95 INCLUDING VAT AND P.&P.

WORLD GEOGRAPHY £7.95

Two excellent educational programs which make learning geographical facts enjoyable and stimulating WORLD GEOGRAPHY covers 166 countries pinpointing each on an accurate high-resolution screen map of the world The countries are divided into 8 categories of difficulty and the program tests your knowledge of capitals and populations U K GEOGRAPHY tests your knowledge of the towns, counties mountain ranges and islands in the United Kingdom You can choose whether to attempt to name the places as they are indicated on the high-resolution map of the British Isles or to find the location of places given by the program Two enthralling and informative programs
●●●*NEW RELEASE*●●●

U.K. GEOGRAPHY £7.95

WE PAY UP TO 20% ROYALTIES FOR HIGH QUALITY COMMODORE 64 PROGRAMS

SUPERIOR SOFTWARE LTD.
Dept. CH12, Regent House,
Skinner Lane, Leeds 7
Tel: 0532 459453

OUR GUARANTEE
1) All our software is available before we advertise
2) All our software is despatched within 48 hours by first class post
3) In the unlikely event that any of our software fails to load return your cassette to us and we will immediately send a replacement

THE BIG THREE

THREE ESSENTIAL PACKAGES CAN BE YOURS FOR WELL UNDER THREE FIGURES!

micro magpie

DATABASE

Micro Magpie for the Commodore 64 is probably the most advanced database management system available for any home micro. With Micro Magpie you can create a database system tailored exactly to your own information handling requirements.

With most database systems you only get out what you put in. Micro Magpie gives you more! It can manipulate data between different files, perform calculations on numerical data, print out reports and hardcopy data in graphical form. Only Micro Magpie can give you all these features.

- ★ Fully user programmable database management system
- ★ Operated by easy-to-use pop-up menus using just four keys
- ★ 100% machine code program for speed and compactness
- ★ Can perform complex calculations on numerical data
- ★ Searches on any field with wild card and part field matching
- ★ Works with one or two 1541 disk drives
- ★ Horizontal or vertical bar graph or scatter graph output
- ★ Integral Centronics interface for parallel printer option
- ★ Professionally written instruction manual.
- ★ Help readily available from Help Disk
- ★ Free application templates - Mailing List and Stock Control

Micro Magpie would be excellent value if you bought it for the applications alone! You can have a highly sophisticated Mailing List system up and running within minutes and you'll still be using only a fraction of Micro Magpie's potential! Once you start tailoring your own custom applications you will begin to discover why Commodore User magazine called Micro Magpie "the software bargain of the year"!

MICRO MAGPIE ON DISK ONLY

£39.95 inc VAT

Micro Swift

SPREADSHEET

Micro Swift - the affordable professional spreadsheet system for the Commodore 64. Micro Swift will prove indispensable in business or around the home to construct models of income and expenditure, for carrying out instant "what if" calculations to see how a change in one or more figures affects all the other figures, or for specialised applications where complex number crunching is required.

Micro Swift is unique in that it is operated by pop-up menus, a system pioneered by our Magpie database program. No longer do you have to memorise a whole hierarchy of commands and control keys - the menus appear when you want them, and disappear when you don't.

Micro Swift is written totally in machine code (beware other spreadsheets in Basic!) for speed and compactness, giving you more room to construct more complex models.

Micro Swift gives you these amazing features.

- ★ A1 to Z254 cell matrix
- ★ Variable cell widths
- ★ Split screen facility
- ★ User definable numerical precision and display formatting
- ★ Integral Centronics interface for parallel printer option
- ★ Automatic execution of user-programmed sequences
- ★ Graphical display option
- ★ Operated by easy-to-use pop-up menus
- ★ Free ready programmed applications included
- ★ File storage on disk or cassette
- ★ Full instruction manual included

Don't be fooled by the price! Micro Swift gives you facilities equal if not superior to spreadsheets costing many times more. Micro Swift is available on disk or cassette. Micro Swift - Spreadsheet power to the people!

MICRO SWIFT ON DISK OR CASSETTE

£19.95 inc VAT

MICRO WORDCRAFT

WORD PROCESSOR

Micro Wordcraft is our new disk-based professional word processor. It is a direct descendant of the highly respected Wordcraft program, which is in use world-wide on the larger Commodore machines, Sirius and IBM PC etc. Written in 100% machine code, Micro Wordcraft spells affordable office quality word processing for the home or business user.

It is often said that "you get what you pay for", but with the Audiogenic Professional Series you get what you pay for and more!

Micro Wordcraft gives you all these advanced facilities.

- ★ Full text control: document width up to 99
- ★ columns, tabs, decimal tabs, justification and centering
- ★ Full text manipulation - on-screen editing, block move, block delete, string search and
- ★ replace, underlining and emboldening
- ★ Scrolling screen display uncluttered by control characters
- ★ Name and address files can be created and merged into standard letters
- ★ Easy merging of standard paragraphs
  Compatible with Commodore parallel and RS232 printers
- ★ Integral Centronics interface for parallel printer option.
  Instantly accessible Help screens
- ★ Comprehensive instruction manual included

The name and address merging capabilities of Micro Wordcraft make it an ideal tool for small businesses, clubs, societies or hobby groups, where there are regular mailings of standard letters. For home use, Micro Wordcraft contains all the facilities you could ever need, at a price you can easily afford!

MICRO WORDCRAFT ON DISK ONLY

£24.95 inc VAT

The Audiogenic Professional Series represents a price breakthrough for business-orientated software products. With Micro Magpie, Micro Swift, and Micro Wordcraft, the power and convenience of the computerised office can be a reality for all Commodore 64 owners!

Each of the three products represents the state of the art in its particular field. Great care has been taken over the documentation to make sure that you, the user, can quickly make use of the facilities available. Also, a full backup service is provided by the Audiogenic Technical Department, who are only a phone call away if you have any queries about the products.

So, whether it's for your home, business, club or society, make sure you go for the Audiogenic Professional Series!

Audiogenic LTD

PROFESSIONAL SERIES

AUDIOGENIC LTD, P.O. BOX 88, READING, BERKS, ENGLAND Tel (0734) 664646